Internal Use Only

Service Manual

LG-P698

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1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the net work, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the  **sign.**

Following information is ESD handling:

• Service personnel should ground themselves by using a wrist strap when exchange system boards.

• When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.

• Use a suitable, grounded soldering iron. • Keep sensitive parts in these protective packages until these are used.

• When returning system boards or parts like EEPROM to the factory, use the protective package as described.

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current – Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIB	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop

PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 Product Name

LGP698 WCDMA850/2100+EGSM/GSM850/DCS/PCS

(HSDPA 3.6Mbps GPRS Class 12 / EDGE Class 12)

2.2 Supporting Standard

Item	Feature	Comment
Supporting Standard	WCDMA(FDD1,8) /EGSM/GSM850/DCS1800/PCS1900 with seamless handover Phase 2+(include AMR) SIM Toolkit : Class 1, 2, 3, C-E	
Frequency Range	WCDMA(FDD1) TX : 1920 – 1980 MHz WCDMA(FDD1) RX : 2110 – 2170 MHz WCDMA(FDD8) TX : 880 – 915 MHz WCDMA(FDD8) RX : 925 – 960 MHz EGSM TX : 880 – 915 MHz EGSM RX : 925 – 960 MHz GSM850 TX : 824 – 849 MHz GSM850 RX : 869 – 894 MHz DCS1800 TX : 1710 – 1785 MHz DCS1800 RX : 1805 – 1880 MHz PCS1900 TX : 1850 – 1910 MHz PCS1900 RX : 1930 – 1990 MHz	
Application Standard	Android Webkit browser 533.1,OMA download 1.0, OMA push SI/SL, OMA Client Provisioning 1.1	

2.3 Main Parts : GSM Solution

Item	Part Name	Comment
Digital Baseband	MSM7227 : Qualcomm	
Analog Baseband	PM7540 : Qualcomm	
RF Chip	RTR6285 : Qualcomm	

2.4 HW Features

Item		Feature	Comment
Form Factor		DOP type	
Battery		1) Capacity Standard : Li-Ion , 1500mAh	
		2) Packing Type : Soft Pack	
Size		Standard : 114 x 59 x 11.7 mm	
Weight		124.6g	With Battery
Volume		TBD	
PCB		L1F1 type, 8 Layers , 0.8t	
Stand by time		2G Up to 740hrs 3G Up to 555 hrs	@ Paging Period 9 (2G) @ DRX 7 (3G)
Charging time		3.5 hrs	@ Power Off / 1500mAh
Talk time		2G Up to 340mins 3G Up to 430mins	@ Tx=Max(2G) @ Tx = 12dBm (3G)
RX sensitivity		WCDMA(FDD1) : -106.7 dBm WCDMA(FDD8) : -103.7 dBm EGSM : -105 dBm GSM850 : -105 dBm DCS 1800 : -105 dBm PCS 1900 : -105 dBm	
TX output power	WCDMA/ GSM/ GPRS	WCDMA : 24dBm/3.84MHz,+1/-3dBm EGSM : 33dBm GSM850 : 33 dBm DCS 1800 : 30 dBm PCS 1900 : 30 dBm	Class3(WCDMA) Class4 (EGSM) Class4 (GSM850) Class1 (PCS) Class1 (DCS)
	EDGE	GSM 900 : 27 dBm DCS 1800 : 26 dBm PCS 1900 : 26 dBm	E2 (GSM900) E2 (PCS) E2 (DCS)
GPRS compatibility		GPRS Class 12	
EDGE compatibility		EDGE Class 12	
SIM card type		Plug-In SIM 3V /1.8V	

Display	Main LCD(HVGA) TFT Main LCD(3.2', 320 x 480)	
Built-in Camera	3M CMOS Camera	
Status Indicator	No	
Keypad	Function Key : 4 Side Key : 3	Function Key: Home, Back, menu, Search Side Key : Volume up, down, power key
ANT	Main : Internal Fixed Type	
System connector	5 Pin	
Ear Phone Jack	3.5Phi, 4 Pole, Stereo	
PC synchronization	Yes	
Memory	NAND Flash : 4Gbit SDRAM : 4Gbit	
Speech coding	FR, EFR, HR,AMR	
Data & Fax	Data	
Vibrator	Built in Vibrator	
Blue Tooth	V3.0 + EDR	
MIDI(for Buzzer Function)	SW Decoded 72Poly	
Music Player	MP3, AAC, AAC+, AAC-LC, AMR-NB, WMA	
Video Player	MPEG4, H.263	
Camcorder	MPEG4, H.263	
Voice Recording	Yes	
Speaker Phone mode Support	Yes	
Travel Adapter	Yes	
CDROM	No	
Stereo Headset	Yes	
Data Cable	Yes	
T-Flash (External Memory)	Yes	

2.5 SW Features

Item	Feature	Comment
RSSI	0 ~ 4 Levels	
Battery Charging	0 ~ 6 Levels	SW Power gauge
Key Volume	0 ~ 7 Level	
Audio Volume	1 ~ 15 Level	
Time / Date Display	Yes	
Multi-Language	Yes	English/French/German/Spanish/Italian/Danish/ Dutch/Korean
Quick Access Mode	Dialing/ Contact / Menu / Message / Camera	
PC Sync	No	
Speed Dial	No	Voice mail center -> 1 key
Profile	Yes	not same with feature phone setting
CLIP / CLIR	Yes	
Phone Book	Name / Number / Email / Chat Id/ Website/Postal addresses/Organizations/Groups/ BirthdayNotes / Ringtone	There is no limitation on the number of items. It depends on available memory amount.
Last Dial Number	Yes	There is no limitation on the number of items. It depends on available memory amount.
Last Received Number	Yes	There is no limitation on the number of items. It depends on available memory amount.
Last Missed Number	Yes	There is no limitation on the number of items. It depends on available memory amount.
Search by Number / Name	Name	
Group	Yes	There is no limitation on the number of items. It depends on available memory amount.
Fixed Dial Number	Yes	
Service Dial Number	No	
Own Number	Yes	Read only (add/edit/delete are not supported)

Voice Memo	Yes	
Call Reminder	No	
Network Selection	Automatic	
Mute	Yes	
Call Divert	Yes	
Call Barring	Yes	
Call Charge (AoC)	No	
Call Duration	Yes	
SMS (EMS)	There is no limitation on the number of items. It depends on available memory amount.	EMS does not support.
SMS Over GPRS	No	
EMS Melody / Picture	No	
Send / Receive / Save	No	
MMS MPEG4 Send / Receive / Save	Yes	
Long Message	MAX 459 characters	SMS 3pages
Cell Broadcast	Yes	
Download	Over the Web	
Game	No	Downloadable Google Market
Calendar	Yes	
Memo	No	Downloadable Google Market
World Clock	No	
Unit Convert	No	Downloadable Google Market
Stop Watch	No	
Wall Paper	Yes	
WAP Browser	Yes	Android Web kit browser 533.1,OMA download 1.0, OMA push SI/SL, OMA Client Provisioning 1.1
Download Melody / Wallpaper	Yes	Over web browser

SIM Lock	Yes	Operator Dependent
SIM Toolkit	Class 1, 2, 3, C	
MMS	Yes	Google MMS Client
EONS	No	
CPHS	No	
ENS	No	
Camera	Yes	3M AF / Digital Zoom : x4
JAVA	No	Android
Voice Dial	No	
IrDa	No	
Bluetooth	Yes	Ver. 3.0+EDR (HSP, HFP, OPP, DUN, A2DP, AVRCP), BT 3.0 High speed not support
FM radio	Yes	
GPRS	Yes	Class 12
EDGE	Yes	Class 12
Hold / Retrieve	Yes	
Conference Call	Yes	Max. 6
DTMF	Yes	
Memo pad	No	
TTY	No	
AMR	Yes	
SyncML	No	
IM	No	
Email	Yes	

2.6 HW SPEC.

1) GSM transceiver specification

Item	Specification
Phase Error	Rms : 5° Peak : 20 °
Frequency Error	GSM : 0.1 ppm DCS/PCS : 0.1 ppm
EMC(Radiated Spurious Emission Disturbance)	GSM/DCS : < -28dBm
Transmitter Output power and Burst Timing	GSM : 5dBm – 33dBm ± 3dB DCS/PCS : 0dBm – 30dBm ± 3dB
Burst Timing	<3.69us
Spectrum due to modulation out to less than 1800kHz offset	200kHz : -36dBm 600kHz : -51dBm/-56dBm
Spectrum due to modulation out to larger than 1800kHz offset to the edge of the transmit band	GSM : 1800-3000kHz :< -63dBc(-46dBm) 3000kHz-6000kHz : <-65dBc(-46dBm) 6000kHz < : < -71dBc(-46dBm) DCS : 1800-3000kHz :< -65dBc(-51dBm) 6000kHz < : < -73dBc(-51dBm)
Spectrum due to switching transient	400kHz : -19dBm/-22dBm(5/0), -23dBm 600kHz : -21dBm/-24dBm(5/0), -26dBm
Reference Sensitivity – TCH/FS	Class II(RBER) : -105dBm(2.439%)
Usable receiver input level range	0.012(-15 - -40dBm)
Intermodulation rejection – Speech channels	± 800kHz, ± 1600kHz : -98dBm/-96dBm (2.439%)
AM Suppression – GSM : -31dBm - DCS : -29dBm	-98dBm/-96dBm (2.439%)
Timing Advance	± 0.5T

2) WCDMA transmitter specification

Item	Specification
Transmit Frequency	Band1 : 1920 MHz ~ 1980 MHz Band8 : 880MHz~915MHz
Maximum Output Power	+24 dBm / 3.84 MHz, +1 / -3 dB
Frequency Error	within ±0.1 PPM
Open Loop Power Control	Normal Conditions : within ±9 dB, Extreme Conditions : within ±12 dB
Minimum Transmit Power	< -50 dBm /3.84 MHz
Occupied Bandwidth	< 5 MHz at 3.84 Mcps (99% of power)
Adjacent Channel Leakage Power Ratio (ACLR)	> 33 dB @ ±5 MHz, > 43 dB @ ±10 MHz
Spurious Emissions |f-fc| > 12.5 MHz	< -36 dBm / 1 kHz RW @ 9 kHz ≤ f < 150 kHz < -36 dBm / 10 kHz RW @ 150 KHz ≤ f < 30 MHz < -36 dBm / 100 kHz RW @ 30 MHz ≤ f < 1 GHz < -30 dBm / 1 MHz RW @ 1 GHz ≤ f < 12.75 GHz < -60 dBm / 3.84 MHz RW @ 869 MHz ≤ f ≤ 894 MHz < -60 dBm / 3.84 MHz RW @ 1930 MHz ≤ f ≤ 1900 MHz < -60 dBm / 3.84 MHz RW @ 2110 MHz ≤ f ≤ 2155 MHz < -67 dBm / 100 kHz RW @ 925 MHz ≤ f ≤ 935 MHz < -79 dBm / 100 kHz RW @ 935 MHz < f ≤ 960 GHz < -71 dBm / 100 kHz RW @ 1805 MHz ≤ f ≤ 1880 MHz < -41 dBm / 300 kHz RW @ 1884.5 MHz < f < 1919.6 MHz
Transmit Intermodulation	< -31 dBc @ 5 MHz & < -41 dBc @ 10 MHz when Interference CW Signal Level = -40 dBc
Error Vector Magnitude	< 17.5 %, when Pout ≥ -20 dBm
Peak Code Domain Error	< -15 dB at Pout ≥ -20 dBm

3) WCDMA receiver specification

Item	Specification
Receive Frequency	Band1 : 2110 ~ 2170 MHz Band8 : 925~960MHz
Reference Sensitivity Level	Band1 : BER < 0.001 when Îor = -106.7 dBm / 3.84 MHz Band8 : BER < 0.001 when Îor = -103.7 dBm / 3.84 MHz
Maximum Input Level	BER < 0.001 when Îor = -25 dBm / 3.84 MHz
Adjacent Channel Selectivity (ACS)	ACS > 33 dB where BER < 0.001 when Îor = -92.7 dBm / 3.84 MHz & Ioac = –52 dBm / 3.84 MHz @ ±5 MHz
Blocking Characteristic	BER < 0.001 when Îor = -103.7 dBm / 3.84 MHz & Iblocking = -56 dBm / 3.84 MHz @ Fuw(offset) = ±10 MHz or Iblocking = -44 dBm / 3.84 MHz @ Fuw(offset) = ±15 MHz
Spurious Response	BER < 0.001 when Îor = -103.7 dBm / 3.84 MHz & Iblocking = -44 dBm
Intermodulation	BER < 0.001 when Îor= -103.7 dBm / 3.84 MHz & Iouw1 = -46 dBm @ Fuw1(offset) = ±10 MHz & Iouw2 = -46 dBm / 3.84 MHz @ Fuw2(offset) = ±20 MHz
Spurious Emissions	< -57 dBm / 100 kHz BW @ 9 kHz ≤ f < 1 GHz < -47 dBm / 1 MHz BW @ 1 GHz ≤ f ≤ 12.75 GHz
Inner Loop Power Control In Uplink	Adjust output(TPC command) cmd 1dB 2dB 3dB +1 +0.5/1.5 +1/3 +1.5/4 0 -0.5/+0.5 -0.5/+0.5 -0.5/+0.5 -1 -0.5/-1.5 -1/-3 -1.5/-4 group(10equal command group) +1 +8/+12 +16/+24

4) HSDPA transmitter specification

<table>
<tr><th>Item</th><th>Specification</th></tr>
<tr><td>Transmit Frequency</td><td>Band1 : 1920 MHz ~ 1980 MHz
Band8 : 880MHz~915 MHz</td></tr>
<tr><td>Maximum Output Power</td><td>Sub-Test
1=1/15, 2=12/15 21~25dBm / 3.84 MHz
3=13/15 4=15/8 20~25dBm / 3.84 MHz
5=15/7 6=15/0 19~25dBm / 3.84 MHz</td></tr>
<tr><td>HS-DPCCH</td><td>
<table>
<tr><th>Sub-test in table C.10.1.4</th><th>Power step</th><th>Power step slot boundary</th><th>Power step size, P [dB]</th><th>Transmitter power step tolerance [dB]</th></tr>
<tr><td rowspan="4">5</td><td>1</td><td>Start of Ack/Nack</td><td>6</td><td>+/- 2.3</td></tr>
<tr><td>2</td><td>Start of CQI</td><td>1</td><td>+/- 0.6</td></tr>
<tr><td>3</td><td>Middle of CQI</td><td>0</td><td>+/- 0.6</td></tr>
<tr><td>4</td><td>End of CQI</td><td>5</td><td>+/- 2.3</td></tr>
</table>
</td></tr>
<tr><td>Spectrum Emission Mask</td><td>Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0
<table>
<tr><th>Frequency offset from carrier △f</th><th>Minimum requirement</th><th>Measurement Bandwidth</th></tr>
<tr><td>2.5 ~ 3.5 MHz</td><td>-35-15×(△f-2.5)dBc</td><td>30 kHz</td></tr>
<tr><td>3.5 ~ 7.5 MHz</td><td>-35-1×(△f-3.5)dBc</td><td>1 MHz</td></tr>
<tr><td>7.5 ~ 8.5 MHz</td><td>-35-10×(△f-7.5)dBc</td><td>1 MHz</td></tr>
<tr><td>8.5 ~ 12.5 MHz</td><td>-49dBc</td><td>1 MHz</td></tr>
</table>
</td></tr>
<tr><td>Adjacent Channel Leakage Power Ratio (ACLR)</td><td>Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0
> 33 dB @ ±5 MHz
> 43 dB @ ±10 MHz</td></tr>
<tr><td>Error Vector Magnitude</td><td>< 17.5 %, when Pout ≥ -20 dBm</td></tr>
</table>

5) HSDPA receiver specification

Item	Specification
Receive Frequency	Band1 : 2110 ~ 2170 MHz Band8 : 925 ~ 960Hz
Maximum Input Level (BLER or R), 16QAM Only	Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0 BLER < 10% or R >= 700kbps

6) WLAN 802.11b transceiver specification

Item	Specification
Transmit Frequency	2400 MHz ~ 2483.5 MHz (CH1~CH13)
Tx Power Level	≤ 20dBm under (Europe), ≤ 30dBm under (USA)
Frequency Tolerance	within ±25 PPM
Chip clock Frequency Tolerance	within ±25 PPM
Spectrum Mask	≤ -30 @ fc-22MHz< f <fc-11MHz and fc+11MHz< f <fc+22MHz ≤ -50 @ f < fc-22MHz and f > fc+22MHz
Power ramp on/off time	≤ 2us
Carrier Suppression	≤ -15dB
Modulation Accuracy (Peak EVM)	≤ 35%
Spurious Emissions	< -36 dBm @ 30MHz ~ 1GHz < -30 dBm above @ 1GHz ~ 12.75GHz < -47 dBm @ 1.8GHz ~ 1.9GHz < -47 dBm @ 5.15GHz ~ 5.3GHz
Rx Min input Sensitivity	≤ -76dBm(1Mbps,2Mbps,5.5Mbps,11Mbps) @ FER ≤ 8%
Rx Max input Sensitivity	≥ -10dBm(1Mbps,2Mbps,5.5Mbps,11Mbps) @ FER ≤ 8%
Rx Adjacent Channel Rejection	≥ 35dB @FER ≤ 8%, interference input signal -70dBm@fc±25MHz(11Mbps)

7) WLAN 802.11g transceiver specification

Item	Specification
Transmit Frequency	2400 MHz ~ 2483.5 MHz (CH1~CH13)
Tx Power Level	≤ 20dBm under (Europe), ≤ 30dBm under (USA)
Frequency Tolerance	within ±25 PPM
Chip clock Frequency Tolerance	within ±25 PPM
Spectrum Mask	≤ -20 @ ±11MHz offset (9Mhz ~ 11MHz) ≤ -28 @ ±20MHz offset (11MHz ~ 20Mhz) ≤ -40 @ ±30MHz offset (20MHz ~ 30Mhz)
Transmitter constellation error (rms EVM)	≤ -5dB
Spurious Emissions	< -36 dBm @ 30MHz ~ 1GHz < -30 dBm above @ 1GHz ~ 12.75GHz < -47 dBm @ 1.8GHz ~ 1.9GHz < -47 dBm @ 5.15GHz ~ 5.3GHz
Rx Min input Sensitivity	PER ≤ 10% -82dBm@6Mbps, -81dBm@9Mbps, -79dBm@12Mbps -77dBm@18Mbps, -74dBm@24Mbps, -70dBm@36Mbps -66dBm@48Mbps, -65dBm@54Mbps
Rx Max input Sensitivity	≥ -20dBm(6,9,12,18,24,36,48,54Mbps) @ PER ≤ 10%
Rx Adjacent Channel Rejection	PER ≤ 10%, ACR ≥ 16dB@6Mbps, ACR ≥ 15dB@9Mbps, ACR ≥ 13dB@12Mbps, ACR ≥ 11dB@18Mbps, ACR ≥ 8dB@24Mbps, ACR ≥ 4dB@36Mbps ACR ≥ 0dB@48Mbps, ACR ≥ -1dB@54Mbps ※ACR shall be measured by setting the desired signal's strength 3 dB above the rate-dependent sensitivity specified in min input sensitivity

8) WLAN 802.11n transceiver specification

Item	Specification
Transmit Frequency	2400 MHz ~ 2483.5 MHz (CH1~CH13)
Tx Power Level	≤ 20dBm under (Europe), ≤ 30dBm under (USA)
Frequency Tolerance	within ±25 PPM
Chip clock Frequency Tolerance	within ±25 PPM
Spectrum Mask	≤ -20 @ ±11MHz offset (9Mhz ~ 11MHz) ≤ -28 @ ±20MHz offset (11MHz ~ 20Mhz) ≤ -45 @ ±30MHz offset (20MHz ~ 30Mhz)
Transmitter constellation error (rms EVM)	≤ -5dB
Spurious Emissions	< -36 dBm @ 30MHz ~ 1GHz < -30 dBm above @ 1GHz ~ 12.75GHz < -47 dBm @ 1.8GHz ~ 1.9GHz < -47 dBm @ 5.15GHz ~ 5.3GHz
Rx Min input Sensitivity	PER ≤ 10% -82dBm@6.5Mbps, -79dBm@13Mbps, -77dBm@19.5Mbps -74dBm@26Mbps, -70dBm@39Mbps, -66dBm@52Mbps -65dBm@58.5Mbps, -64dBm@65Mbps
Rx Max input Sensitivity	≥ -20dBm(6.5,13,19.5,26,39,52,58.5,65Mbps) @ PER ≤ 10%
Rx Adjacent Channel Rejection	PER ≤ 10%, ACR ≥ 16dB@6.5Mbps, ACR ≥ 13dB@13Mbps, ACR ≥ 11dB@19.5Mbps, ACR ≥ 8dB@26Mbps, ACR ≥ 4dB@39Mbps, ACR ≥ 0dB@52Mbps ACR ≥ -1dB@58.5Mbps, ACR ≥ -2dB@65Mbps ※ ACR shall be measured by setting the desired signal's strength 3 dB above the rate-dependent sensitivity specified in min input sensitivity. (Test Condition: non-STBC mode, 800ns GI and Binary Convolutional Code)

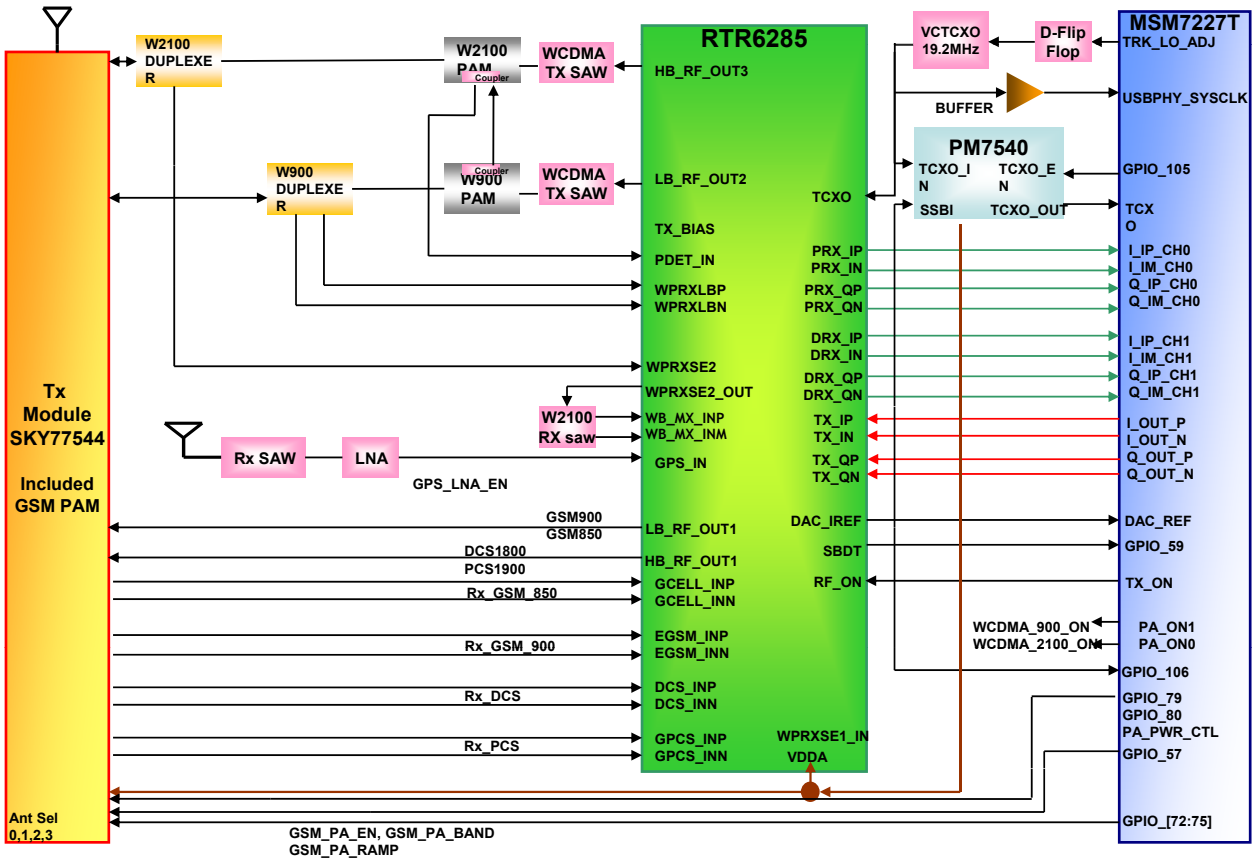
9) GPS receiver specification

Item	Specification
Receive Frequency	1574.42 MHz ~ 1576.42 MHz
Minimum Sensitivity	1 satellite ≥-142dBm, 7 satellites ≥ -147dBm at coarse time aiding

3. TECHNICAL BRIEF

3.1 GENERAL DESCRIPTION

The LG-P698 supports UMTS-900, UMTS-2100, GSM-850, GSM-850, GSM-900, GSM-1800, and GSM-1900 based GSM/GPRS/EDGE/UMTS. All receivers and the UMTS transmitter use the radioOne1Zero-IF architecture to eliminate intermediate frequencies, directly converting signals between RF and baseband. The quad-band GSM transmitters use a baseband-to-IF upconversion followed by an offset phase-locked loop that translates the GMSK-modulated or 8-PSK-modulated signal to RF.



[Figure 1-1] Block diagram of RF part

A generic, high-level functional block diagram of LGP698 is shown in Figure 1-1. One antenna collects base station forward link signals and radiates handset reverse link signals. The antenna connects with receive and transmit paths through a ASM(Antenna-Switch-Module).

The UMTS receive paths each include an LNA, an RF band-pass filter, and a downconverter that translate the signal directly from RF-to-baseband using radioOne ZIF techniques. The RFIC's Rx analog baseband outputs, for the receive chains, connect to the MSM IC. The UMTS and GSM Rx baseband outputs share the same inputs to the MSM IC.

For the transmit chains, the RTR6285 IC directly translates the Tx baseband signals (from the MSM device) to an RF signal using an internal LO generated by integrated onchip PLL and VCO. The RTR6285 IC outputs deliver fairly high-level RF signals that are first filtered by Tx SAWs and then amplified by their respective UMTS PAs. In the GSM receive path, the received RF signals are applied through their band-pass filters and down-converted directly to baseband in the RTR6285 transceiver IC. These baseband outputs are shared with the UMTS receiver and routed to the MSM IC for

further signal processing.

The GSM/EDGE transmit path employs one stage of up-conversion and, in order to improve efficiency, is divided into phase and amplitude components to produce an open-loop Polar topology:

1. The on-chip quadrature up-converter translates the GMSK-modulated signal or 8-PSK modulated signal, to a constant envelope phase signal at RF;
2. The amplitude-modulated (AM) component is applied to the ramping control pin of Polar power amplifier from a DAC within the MSM LGP698 power supply voltages are managed and regulated by the PM7540 Power Management IC. This versatile device integrates all wireless handset power management, general housekeeping, and user interface support functions into a single mixed signal IC.

It monitors and controls the external power source and coordinates battery recharging while maintaining the handset supply voltages using low dropout, programmable regulators.

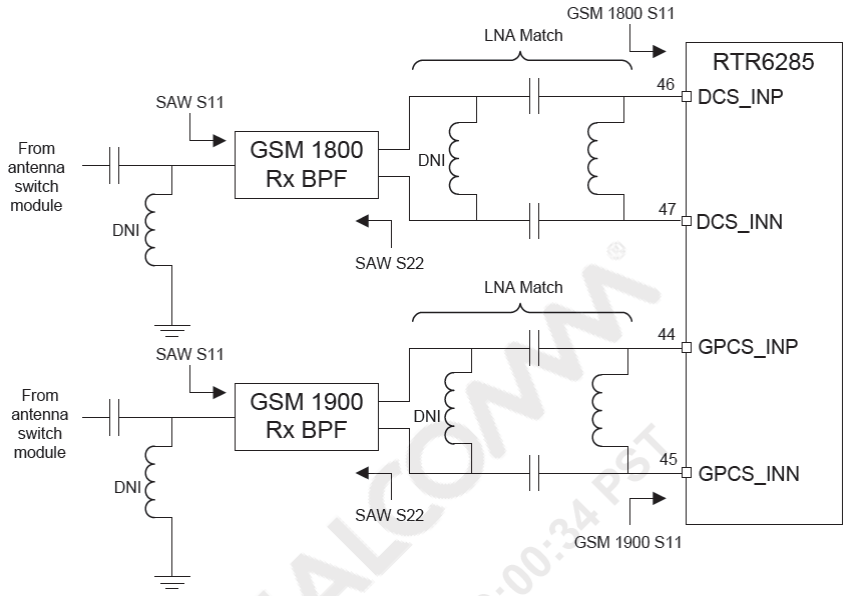
The device's general housekeeping functions include an ADC and analog multiplexer circuit for monitoring on-chip voltage sources, charging status, and current flow, as well as user-defined off-chip variables such as temperature, RF output power, and battery ID.

Various oscillator, clock, and counter circuits support IC and higher-level handset functions. Key parameters such as under-voltage lockout and crystal oscillator signal presence are monitored to protect against detrimental conditions.

3.2 GSM MODE

3.2.1 GSM RECEIVER

The GSM-850, GSM-900, GSM-1800, and GSM-1900 receiver inputs of RTR6285 are connected directly to the transceiver front-end Module. GSM-850, GSM-900, GSM-1800, and GSM-1900 receiver inputs use differential configurations to improve common-mode rejection and second-order non-linearity performance. For example Figure 1-2 shows receiver input topologies for DCS and PCS (GSM-850/900 have the same receiver input topologies). The balance between the complementary signals is critical and must be maintained from the RF filter outputs all the way into the IC pins.



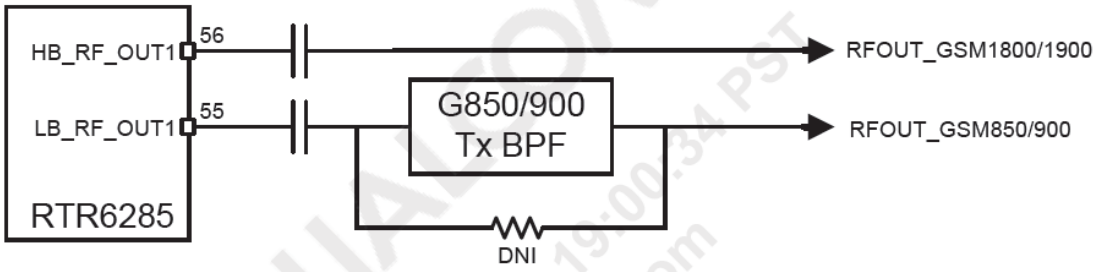
[Figure 1-2] DCS and PCS Receiver Inputs Topologies

Since GSM-850, GSM-900, GSM-1800, and GSM-1900 signals are time-division duplex (the handset can only receive or transmit at one time), switches are used to separate Rx and Tx signals in place of frequency duplexers – this is accomplished in the switch module. The GSM-850, GSM-900, GSM-1800, and GSM-1900 receive signals are routed to the RTR6285 through band selection filters and matching networks that transform single-ended 50-Ω sources to differential impedances optimized for gain and noise figure. The RTR input uses a differential configuration to improve second-order intermodulation and common mode rejection performance. The RTR6285 input stages include MSM-controlled gain adjustments that maximize receiver dynamic range.

The amplifier outputs drive the RF ports of the quadrature RF-to-baseband downconverters. The downconverted baseband outputs are multiplexed and routed to lowpass filters (one I and one Q) having passband and stopband characteristics suitable for GMSK or 8-PSK processing. These filter circuits include DC offset corrections. The filter outputs are buffered and passed on to the MSM7227 IC for further processing asshown in Figure 1-2.

3.2.2 GSM TRANSMITTER

The RTR6285 transmitter outputs(HB_RF_OUT1 and LB_RF_OUT1) include on-chip output matching inductors. 50ohm output impedance is achieved by adding a series capacitor at the output pins. The capacitor value may be optimized for specific applications and PCB characteristics based on pass-band symmetry about the band center frequency as shown in Figure 1-3.



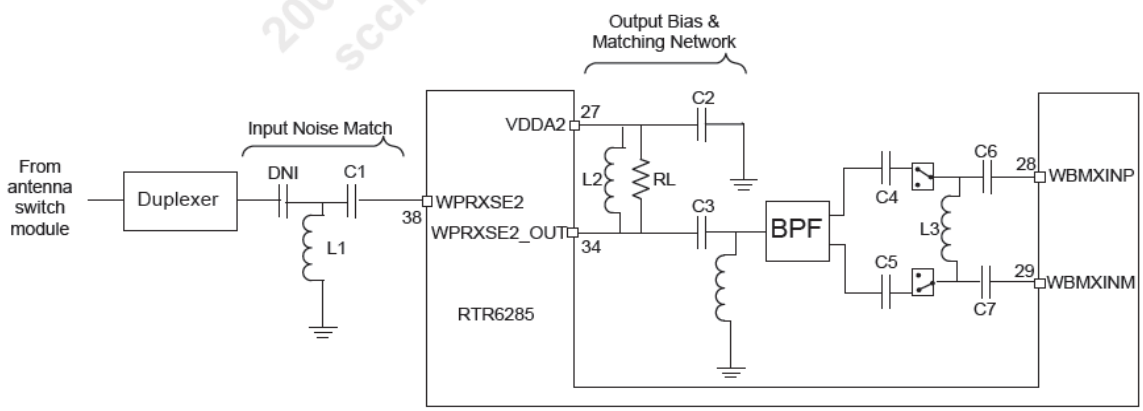
[Figure 1-3] GSM Transmitter Outputs Topologies

The RTR6285 IC is able to support GSM 850/900 and GSM 1800/1900 mode transmitting. This design guideline shows a tri-band GSM application. Both high-band and low band outputs are followed by resistive pads to ensure that the load presented to the outputs remains close to 50ohm.

3.3 UMTS MODE

3.3.1 UMTS RECEIVER

The UMTS duplexer receiver output is routed to LNA circuits within the RTR6285 device as shown in Figure 1-4. The UMTS Rx input is provided with an on-chip LNA that amplifies the signal before a second stage filter that provides differential downconverter as shown in Figure 1-5. This second stage input is configured differentially to optimize secondorder intermodulation and common mode rejection performance. The gain of the UMTS frontend amplifier and the UMTS second stage differential amplifier are adjustable, under MSM control, to extend the dynamic range of the receivers. The second stage UMTS Rx amplifiers drive the RF ports of the quadrature RF-to-baseband downconverters. The downconverted UMTS Rx baseband outputs are routed to lowpass filters having passband and stopband characteristics suitable for UMTS Rx processing. These filter circuits allow DC offset corrections, and their differential outputs are buffered to interface shared with GSM Rx to the MSM IC. The UMTS baseband outputs are turned off when the RTR6285 is downconverting GSM signals and on when the UMTS is operating.



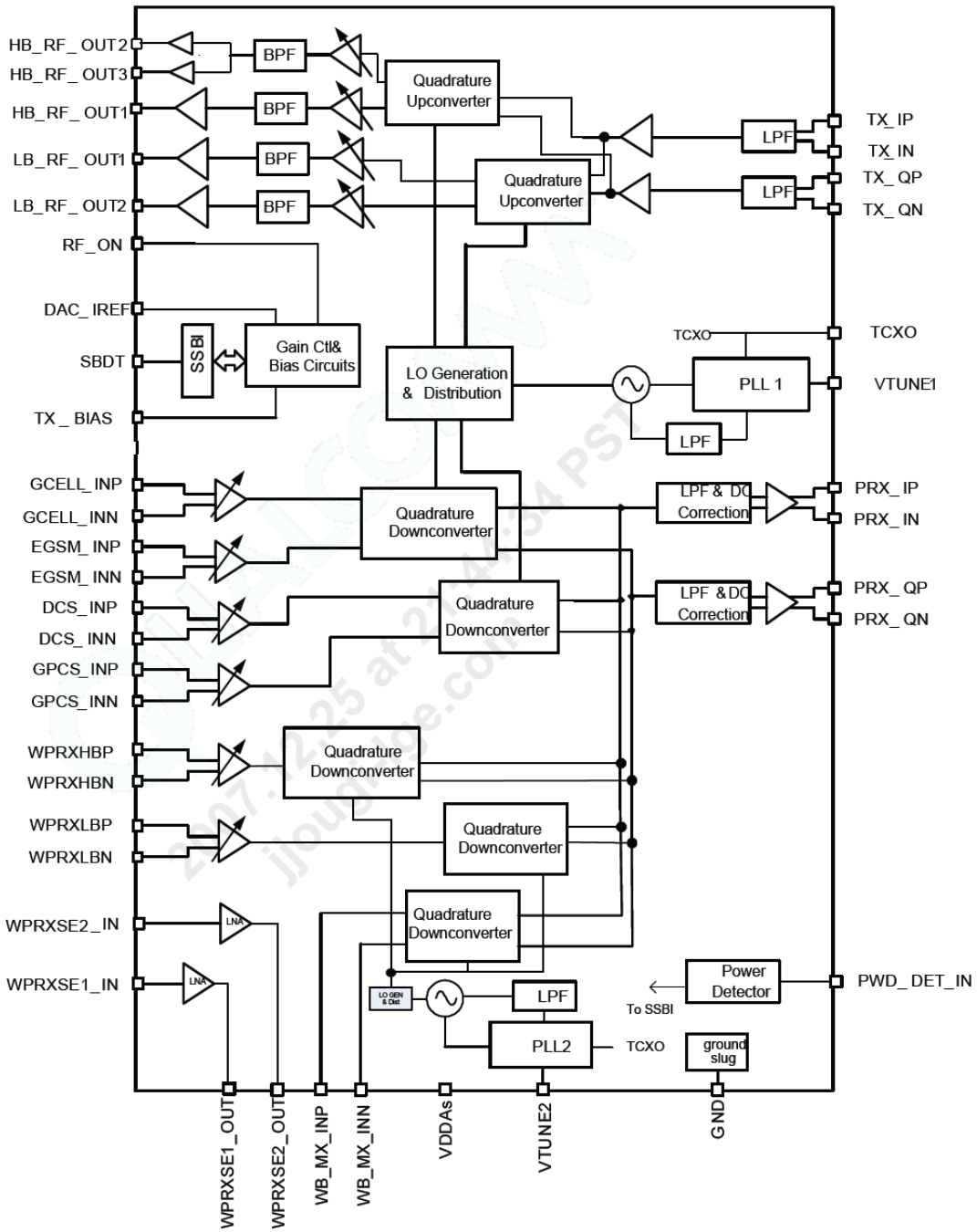
[Figure 1-4] UMTS Receiver Inputs Topologies

3.3.2 UMTS TRANSMITTER

The UMTS Tx path begins with differential baseband signals (I and Q) from the MSM device. These analog input signals are amplified, filtered, and applied to the quadrature up-converter mixers. The up-converter output is amplified by multiple variable gain stages that provide transmit AGC control. The AGC output is filtered and applied to the driver amplifier; this output stage includes an integrated matching inductor that simplifies the external matching network to a single series capacitor to achieve the desired 50-Ω interface.

The RTR6285 UMTS output is routed to its power amplifier through a band pass filter, and delivers fairly high-level signals that are filtered and applied to the PA. Transmit power is delivered from the duplexer to the antenna through the switch module. The transceiver LO synthesizer is contained within the RTR6285 IC with the exception of the off-chip loop filter components and the VC-TCXO. This provides a simplified design for multimode applications. The PLL circuits include a reference divider, phase detector, charge pump, feedback divider, and digital logic generator.

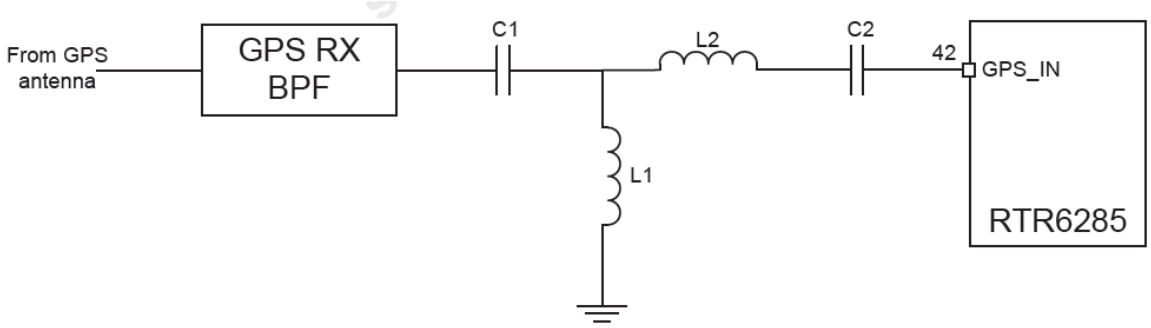
UMTS Tx. Using only PLL1, the LO generation and distribution circuits create the necessary LO signals for nine different frequency converters. The UMTS transmitter also employs the ZIF architecture to translate the signal directly from baseband to RF. This requires FLO to equal FRF, and the RTR6285 IC design achieves this without allowing FVCO to equal FRF. The RTR6285 IC is able to support UMTS 2100/1900/1800/1700 and 850 mode transmitting. This design guideline shows only UMTS 2100 applications.



[Figure 1-5] RTR6285 IC Functional Block Diagram

3.4 GPS RECEIVER

The GPS receiver input employs a single-ended connection realized by this pin. The GPS input is routed from the GPS antenna switch, through a band pass filter and then an impedance transformer circuit that optimally matches the impedance looking into the GPS LNA. The impedance transformer circuit topology is shown in Figure 1-6.



[Figure 1.6] GPS Input Network Topology

3.5 LO GENERATION and DISTRIBUTION CIRCUIT

The integrated LO generation and distribution circuits are driven by internal VCOs to support various modes to yield highly flexible quadrature LO outputs that drive all GSM/EDGE, UMTS band and GPS up-converters and down-converters; with the help of these LO generation and distribution circuits, true zero-IF architecture is employed in all GSM and UMTS band receivers and transmitters to translate the signal directly from RFto-baseband and from baseband-to-RF. Two fully functional fraction-N synthesizers, including VCOs and loop filters, are integrated within the RTR6285 IC. In addition, the RTR6285 has a third synthesizer used for GPS operation. The first synthesizer (PLL1) in the RTR6285 creates the transceiver Los that support the UMTS transmitter, and all four GSM band receivers and transmitters including: GSM850, GSM900, GSM1800, and GSM1900. The second synthesizer (PLL2) in the RTR6285 IC provides the LO for the UMTS primary receiver. For the RTR6285 IC only, the second synthesizer also provides the LO for the secondary UMTS receiver. The third synthesizer (PLL3), only in the RTR6285 IC, provides the LO for the GPS receiver. An external TCXO input signal is required to provide the synthesizer frequency reference to which the PLL is phase and frequency locked. The RTR6285 ICs integrate most of the PLL loop filter components on-chip except for three off-chip loop filter-series capacitors, which significantly reduces off-chip component requirement. With the integrated fractional-N PLL synthesizers, the RTR6285 ICs have the advantage of more flexible loop bandwidth control, fast lock time, and low-integrated phase error.

3.6 OFF-CHIP RF COMPONENTS

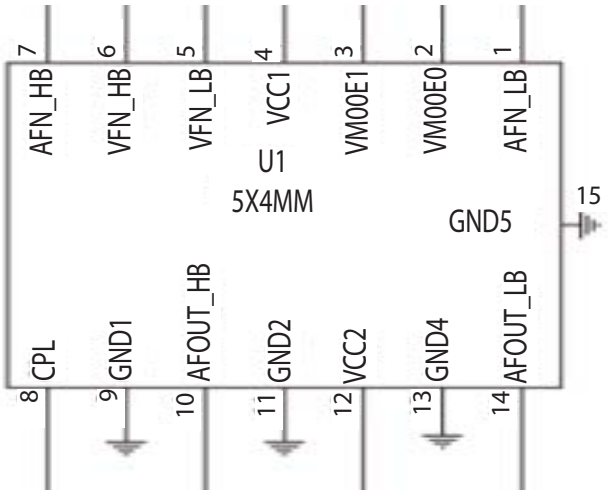
3.6.1. UMTS Dual PAM

3.6.1.1 W2100, W850 (U1102, SKY77197)

The SKY77197 Power Amplifier Module (PAM) is a fully matched, 14-pad, surface mount module developed for Wideband Code Division Multiple Access (WCDMA) applications. This small and efficient module packs full WCDMA Band I and Band V coverage into a single compact package. The SKY77197 meets the stringent spectral linearity requirements of WCDMA transmission, with high power added efficiency for power output to 28.25 dBm (Band I and Band V). The SKY77197 meets the stringent spectral linearity requirements of High Speed Downlink Packet Access (HSDPA) data transmission with high power added efficiency. A directional coupler is integrated into the module thus eliminating the need for any external coupler.

The single Gallium Arsenide (GaAs) Microwave Monolithic Integrated Circuit (MMIC) contains all active circuitry in the module. The MMIC contains on-board bias circuitry, as well as input and interstage matching circuits. Output match into a 50-ohm load is realized off-chip within the module package to optimize efficiency and power performance.

The SKY77197 PAM is manufactured with Skyworks' InGaP GaAs Heterojunction Bipolar Transistor (HBT) BiFET process that provides for all positive voltage DC supply operation while maintaining high efficiency and good linearity. No VREF voltage is required. Power down is accomplished by setting the voltage on VENABLE to zero volts. No external supply side switch is needed as typical "off" leakage is a few microamperes with full primary voltage supplied from the battery.



[Figure 1.7] SKY77197 (W2100/W850)

3.6.2 19.2MHz VCTCXO (X2000, X1G003581002700)

The Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) provides the reference frequency for all RFIC synthesizers as well as clock generation functions within the MSM7227T IC. The oscillator frequency is controlled by the MSM7227T ICs.

TRK_LO_ADJ pulse density modulated signal in the same manner as the transmit gain control TX_AGC_ADJ. A two-pole RC low pass filter is recommended on this control line.

The PM7540 IC controls the handset power-up sequence, including a special VCTCXO warm-up interval before other circuits are turned on. This warm-up interval (as well as other TCXO controller functions) is enabled by the MSM TCXO_EN line . The PM7540 IC VREG_TCXO regulated output voltage is used to power the VCTCXO and is enabled before most other regulated outputs. Any GSM mode power control circuits within the MSM7227T IC require a reference voltage for proper operation and sufficient accuracy. Connecting the PM7540 IC REF_OUT directly to the MSM7227T IC GSM_PA_PWR_CTL_REF provides this reference. This sensitive analog signal needs a 0.1 µF low frequency filter near to MSM side, and isolate from digital logic and clock traces with ground on both sides, plus ground above and below if routed on internal layers.

] Electrical characteristics

(V_{CC}=2.8 V, V_C=1.4 V, GND=0.0 V, Load 10 kΩ//10 pF(DC cut), T_use = +25 °C)

Parameter	Symbol	Value		Unit	Note
		Min.	Max.		
Start up time	tosc		3.0	ms	Within +/- 0.5×10^{-6} of final frequency t=0 s at Vcc=2.66 V
Current consumption	Icc		1.4	mA	
Output level	Vpp	0.8		V	Peak to peak voltage
Symmetry	SYM	40	60	%	GND Level
Harmonics	-		-5	dBc	
SSB Phase noise	L(f)		-86	dBc/Hz	Offset:10 Hz
			-110		Offset:100 Hz
			-130		Offset:1 kHz
			-144		Offset:10 kHz
			-144		Offset:100 kHz
Square root Allan Variance	σy(τ)		0.5×10^{-9}	-	τ= 0.1s

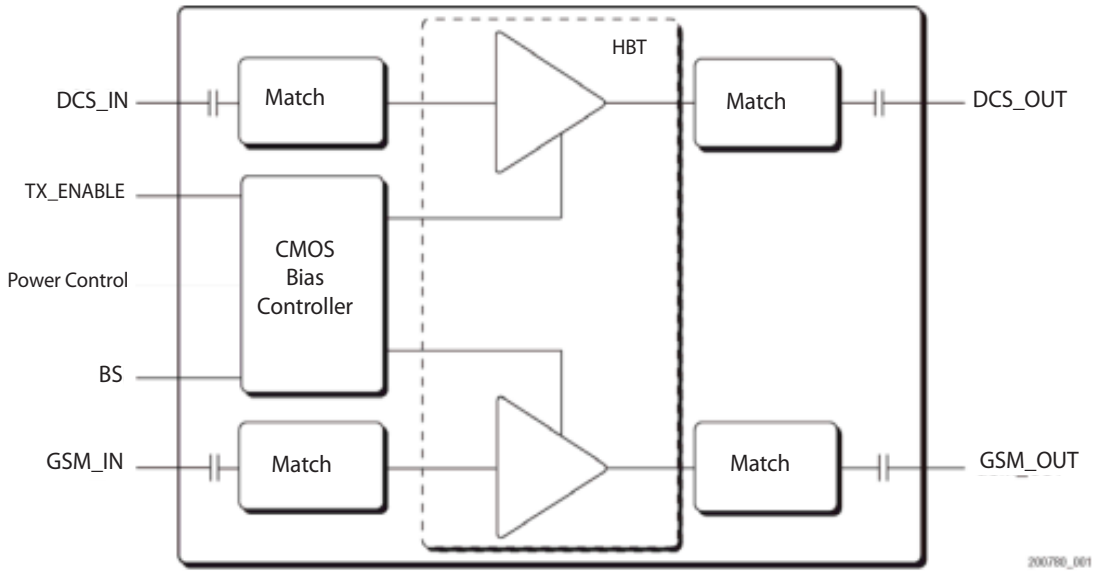
3.6.3 GSM PAM (U1101, SKY77336)

SKY77336 Power Amplifier Module (PAM) is designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800 and PCS1900, supporting Gaussian Minimum-Shift Keying (GMSK) and Polar Enhanced Data for GSM Evolution (EDGE) modulation. Class 12 General Packet Radio Service (GPRS) multi-slot operation is also supported.

The module consists of GSM850/900 PA and DCS1800/PCS1900 PA blocks, impedance matching circuitry for 50 Ω input and output impedances, and a Power Amplifier Control (PAC) block. The custom CMOS integrated circuit provides the internal PAC function and interface circuitry. Fabricated in InGaP/GaAs, the Heterojunction Bipolar Transistor (HBT) PA blocks support the GSM850/900 bands and DCS1800/PCS1900 bands. Both PA blocks share common power supply pads to distribute current. The InGaP/GaAs die, Silicon (Si) controller die, and passive components are mounted on a multi-layer laminate substrate and the entire assembly is encapsulated with plastic overmold.

RF input and output ports of the SKY77336 are internally matched to a 50 Ω load to reduce the number of external components for a quad-band design. Extremely low leakage current (10 µA, typical) of the PAM module maximizes handset standby time.

The SKY77336 also contains band-select switching circuitry to select GSM (logic 0) or DCS/PCS (logic 1) as determined from the Band Select (BS) signal. See Figure 1 shown below.



[Figure 1.10] SKY77336 Block Diagram

Mode	Input Control Bits		850/EGSM Tx	DCS/PCS Tx
	Tx_EN	BS		
Standby	0	X	Dlsable	Dlsable
850/EGSM Tx	1	0	Enable	Dlsable
Tx DCS/PCS	1	1	Dlsable	Enable

[Figure 1.10] SKY77336 Control Logic

3.6.4 GPS LNA (U1103, RF2815)

The RF2815 is a GPS Low Noise Amplifier with an integrated SAW filter at the output. Low noise figure, along with high gain, achieved by the RF2815 makes it ideal for GPS receivers requiring high sensitivity. This module builds upon RFMD's leading edge pHEMT process and integrates input matching and low loss high rejection SAW filter at the output. This results in high performance and a reduced solution size. The ease of implementation simplifies the receiver design.

The RF2815 is packaged in a compact 3.3 mm x 2.1 mm x 1.2 mm package with low external component count required to achieve the best-in-class performance.

3.7 Digital Baseband(DBB/MSM7227T)

3.7.1 General Description

A. Features(MSM7227T)

The basic MSM7227 system solution consists of the MSM7227T, RTR6285™, and PM7540™ ICs, plus AMSS™ system software with the SURF7227™ platform available for development. General features include:

-WCDMA Rel '99 plus HSDPA and HSUPA

-GSM/GPRS/EDGE

-High-performance ARM1136JF-S™ application processor at up to 600 MHz; QDSP6900™ at 320 MHz

-High-performance ARM926EJ-S™ modem processor at up to 400 MHz; QDSP4000™ at 122.88 MHz

-Java® hardware acceleration for faster Java-based games and other applets

-Support for Bluetooth® 2.1 EDR via an external Bluetooth System-on-Chip (SoC)

-High-speed, serial mobile display digital interface (MDDI) that optimizes the interconnection cost between the MSM device and the LCD panel

-Receive diversity support for WCDMA mode, thereby providing improved capacity and data throughput

-USB 2.0 compliant high-speed USB core with limited OTG capabilities

-Integrated high-speed USB PHY

-Integrated wideband stereo codec for digital audio applications

-Direct interface to digital camera module with video front-end (VFE) image processing

-GPS position location capabilities

-Vocoder support (GSM-HR, FR, EFR, AMR, and AMR-WB/+)

-Advanced 12 × 12 ×1.05 mm, 0.4 mm pitch, 560 NSP

3.8 Hardware Architecture

<System HW Block>

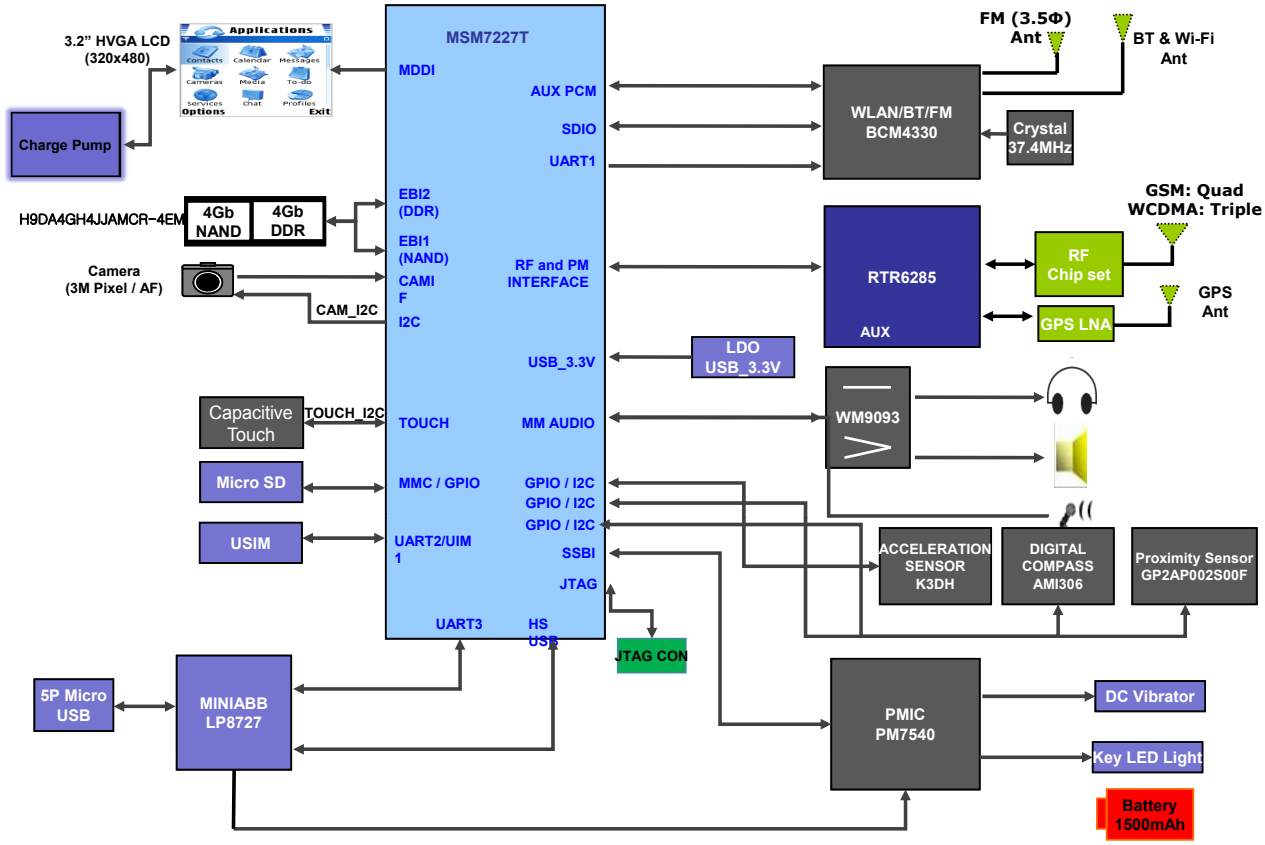


Figure. Block Diagram

<Power Block>

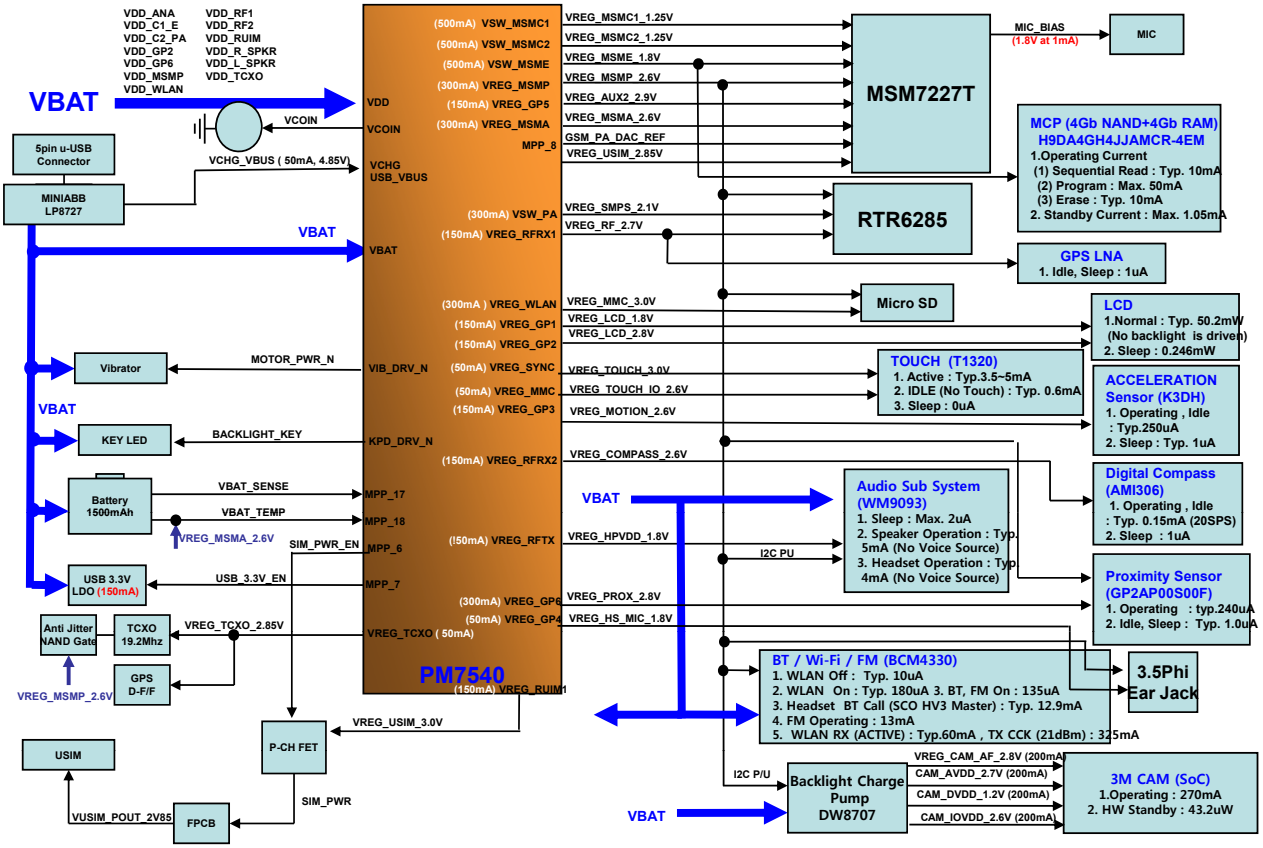


Figure. Simplified Block Diagram

3.9 Subsystem (MSM7227T)

3.9.1. ARM Microprocessor Subsystem

The MSM7227T device single-wire SBI (SSBI) the ARM926EJ-S configures and controls the functionality of the RTR6285 and PM7540 devices.

3.9.2. WCDMA Subsystem

The WCDMA subsystem performs th uses an embedded ARM1136JF-S, ARM926EJ-S microprocessor. This microprocessor, through the system software, controls most of the functionality for the MSM, including control of the external peripherals such as the keypad, LCD, SDRAM, and NANDFlash devices. Through a QUALCOMM proprietary e data conversions and signal processing necessary to maintain the WCDMA air interface between the handset and the base station (and also the WCDMA network). The subsystem components include:

-Searcher engine

-Demodulating fingers

-Combining block

-Frame deinterleaver

-Viterbi decoder

-Reverse link subsystem

-Turbo decoder

On the forward link traffic channel, the WCDMA subsystem searches, demodulates, and decodes incoming pilot, sync, paging, and traffic channel information. It extracts low bit-rate packet data from the forward link traffic channel and sends the packet data to the vocoder for processing. On the reverse link, the WCDMA subsystem processes the packet data from the vocoder and modulates the reverse traffic channel.

3.9.3. GSM Subsystem

The GSM subsystem performs the data conversions and signal processing necessary to maintain the GSM air interface, including PA gain control for GPRS support. For GSM, the power profile ramps up before the burst and ramps down afterward. For GPRS, transmit bursts can occur in as many as four sequential slots and the PA must be ramped up and down smoothly between each slot, holding the desired output power level during each burst. GSM support includes:

-GSM release '99 (circuit switching)

-GPRS (packet switching)

-EDGE E2 power class for 8 PSK

3.9.4 RF Interface

The RF interface communicates with the mobile station's external RF and analog baseband circuits. Signals to these circuits control signal gain in the Rx and Tx signal path and maintain The system's frequency reference.

3.9.5 Single-wire serial bus interface (SSBI)

The MSM7227T device's SSBI is designed specifically to be a quick, low pin count control protocol for QUALCOMM's RTR6285 and PM7540 ASICs. Using the SSBI, the RTR6285 and PM7540 devices can be configured for different operating modes and for minimum power consumption, extending battery life in Standby mode. The SBI also controls DC baseband offset errors.

3.9.6 Audio function

MSM7227T audio functions include the analog Rx and Tx paths (or stereo wideband codec), audio digital signal processing (DSP) that provides adjustable gains and filtering, PCM circuits for interfacing with external devices, and additional audio DSP that actually implements encoding and decoding. Other key features include:

-The wideband codec supports stereo music/ringer melody applications in addition to the 8 kHz voice band applications on the forward link.

-A PCM interface allows an external codec to be used instead of the internal codec; this supports inter-IC Sound (I2S) modes that allow an external stereo DAC or SADC to be used.

-Currently in AMSS baseline only I2S output mode is supported (SDAC-only, no SADC support).

-Audio decoder summing and headset switch detection are included.

-Audio DSP includes the Rx and Tx filters needed to meet ITU-T G.712 requirements.

-A programmable sidetone path provides for summing part of the Tx audio into the Rx path.

-Many codec parameters are configurable via SBI registers.

-The audio processing is configured through QDSP5 command types and is not directly controlled by the microprocessor.

3.9.7 Vocoder Subsystem

The MSM7227T device's QDSP4000 supports AMR,FR,EFR and HR. In addition, the QDSP4000 has modules to support the following audio functions: DTMF tone generation, DTMF tone detection, Tx/Rx volume controls, Tx/Rx automatic gain control (AGC), Rx Automatic Volume Control (AVC), EarSeal Echo Canceller (ESEC), Acoustic Echo Canceller (AEC), Noise Suppression (NS), and programmable, 13-tap, Type-I, FIR, Tx/Rx compensation filters. The MSM7227 device's integrated ARM9TDMI processor downloads the firmware into the QDSP4000 and configures QDSP4000 to support the desired functionality.

3.9.8 Mode Select and JTAG Interfaces

The mode pins to the MSM7227T device determine the overall operating mode of the ASIC. The options under the control of the mode inputs are Native mode, which is the normal subscriber unit operation, ETM mode, which enables the built-in trace mode, and test mode for factory testing. The MSM7227 device meets the intent of the ANSI/IEEE 1149.1A-1993 feature list. The JTAG interface can be used to test digital interconnects between devices within the mobile station during manufacture.

3.9.9 General-Purpose Input/Output Interface

The MSM7227T IC includes 133 general purpose input/output (GPIO) pins, and each can be configured as a digital input or digital output. Inputs can be set to have a pull-up, pull-down, keeper, or no-pull. Output drive strength is also programmable. Software assigns functions to the GPIOs and their configurations are set accordingly. Some of the GPIO pins have alternate functions supported on them. The alternate functions include USB interface, additional RAM, ROM, general-purpose chip selects, parallel LCD interface, and a UART interface. The function of these pins is documented in the various software releases.

3.9.10 UART

The MSM7227T device employs three UARTs. UART1 has dedicated pins while UART2 and UART3 share multiplexed pins.

-UART1 for Bluetooth

-UART2 for USIM interface

-UART3 for data

.

3.9.11. USB

The MSM7227T IC supports one High Speed USB (HS-USB) USBH port with built-in PHY and one Full Speed USB-UICC port. The MSM7227 IC supports USB interfaces using two controllers:

-The primary controller is the HS-USB port with an integrated physical layer (PHY). This HS-USB port is also capable of supporting USB operations at low-speed and full-speed.

-The secondary controller is the FS USB-UICC port, which only supports host mode functionality.

3.10 Power Block

3.10.1. General

MSM7227T, included RF, is fully covered by PM7540 (Qualcomm PMIC). PM7540 cover the power of MSM7227, MSM memory, RF block, Bluetooth, USIM and TCXO.

Major power components are :

PM7540 (U402) : Phone main PMIC

3.10.2 PM7540

The PM7540 device (Figure) integrates all wireless handset power management. The power management portion accepts power from all the most common sources – battery, external charger, adapter, coin cell back-up – and generates all the regulated voltages needed to power the appropriate handset electronics. It monitors and controls the power sources, detecting which sources are applied, verifying that they are within acceptable operational limits, and coordinates battery and coin cell recharging while maintaining the handset electronics supply voltages. Eight programmable output voltages are generated using low dropout voltage regulators, all derived from a common trimmed voltage reference. A dedicated controller manages the TCXO warm-up and signal buffering, and key parameters (under-voltage lockout and crystal oscillator signal presence) are monitored to protect against detrimental conditions. MSM device controls and statuses the PM7540 IC using Single-wire SBI(SSBI) supplemented by an Interrupt Manager for time-critical information. Another dedicated IC Interface circuit monitors multiple trigger events and controls the power-on sequence.

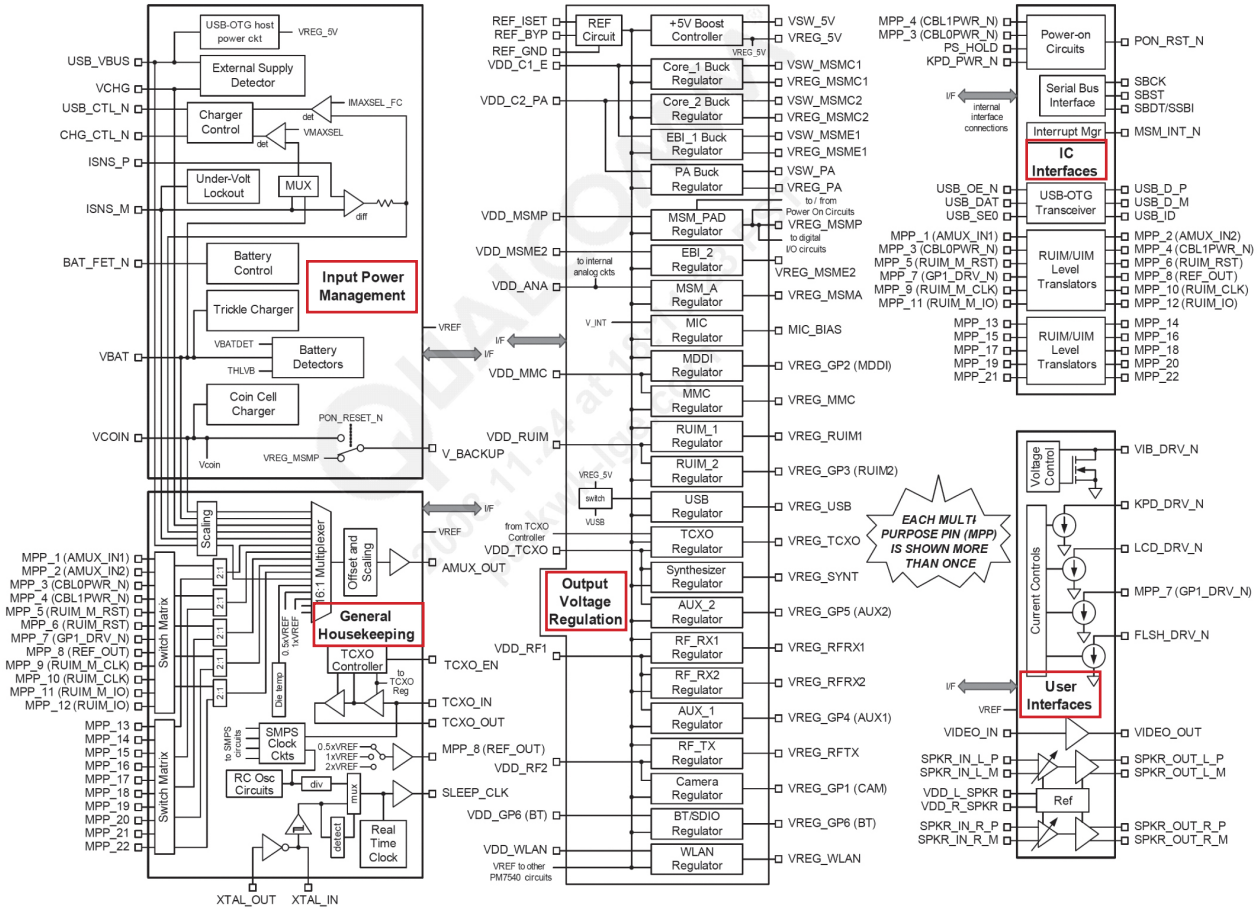


Figure. PM7540 functional block diagram

3.10.3. Charging control

The RT8965 integrates a single-cell Li-ion battery charger IC with pre-charge mode, a fast charge mode (constant current mode) or constant voltage mode. The charge current is programmable via the I2C interface as shown in the control register address tables, CHG_Ctrl1 and

CHG_Ctrl2. The CV mode voltage is fixed at 4.2V. The pre-charge threshold is fixed at 2.6V. If the battery voltage is below the pre-charge threshold, the RT8965 charges the battery with a trickle current until the battery voltage rises above the pre-charge threshold. The RT8965 is capable of being powered up from AC adapter and USB (Universal Serial Bus) port inputs. Moreover, the RT8965

includes a linear regulator (LDO 4.9V, 50mA) for supplying low power external circuitry.

3.10.3.1 Pre-Charge Mode

Figure 1 shows the RT8965 charging state of the charging function. During a charge cycle, if the battery voltage is below the VPRECH threshold (typical value is 2.6V), the charger enters pre-charge mode. This feature revives deeply discharged cells and protects battery life. The precharge current has a typical value of 50mA.

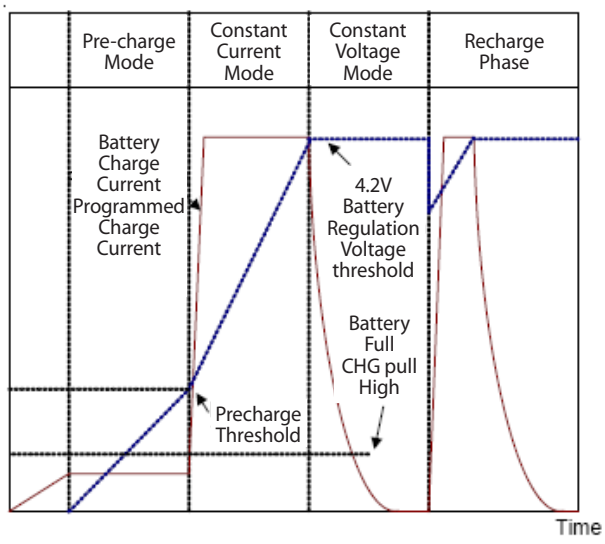


Figure. RT8965 Charging State of the Charger Function

3.10.3.2 Constant Current Charging

Once the battery voltage is higher than 2.6V, the charger enters the constant current stage. The constant current level can be programmed from 90mA to 1A via the I2C compatible interface but the default value is 400mA.

3.10.3.3 Constant Voltage Charging

Once the battery voltage level closes in at 4.2V, the charger enters constant voltage phase and the charging current begins to decrease. When the charging current becomes lower than IEOC (end of charge current), the loop enters charge done mode. The RT8965 will then send an interrupt and register CHG bit, as shown in Table 10. Finally, INT_STA2 becomes 0 to indicate that the RT8965 has completed the charging.

3.10.3.4 Recharge Phase

When any loading or event causes VBAT to drop or battery to discharge, the charger will automatically jump to the appropriate mode to recharge the battery.

3.10.3.5 Charger for Factory Mode

The RT8965 provides factory mode for supplies up to 2.3A for powering external loads with no battery installed and VBAT is regulated to 4.2V. The factory mode allows the user to supply system power with no battery connected. It is programmable by I2C via the PTM bit, as shown in Table 13. In factory mode, thermal regulation is disabled, but thermal protection (135℃) is still active. When using currents greater than 1.5A in factory mode, the user must limit the duty cycle at the maximum current to 20% with a maximum period of 10ms

3.10.3.6 LGP698 Charging Specification

-Charging Method : Pre-Charging & CC & CV (Pre-Charging &Constant Current & Constant Voltage)

-Maximum Charging Voltage : 4.2V

-Maximum Charging Current : 700mA

-Nominal Battery Capacity : 1500mAh

-Charging time : Max. 3h 30m

- Full charge indication current (icon stop current) : 89mA

3.10.3.7 LGP698 battery bar icon display

Battery Bar Number	Specification	
BAR 6 (Full)	90% over	Remain %
BAR 6 --> 5	90% → 89%	
BAR 5 --> 4	70% → 69%	
BAR 4 --> 3	50% → 49%	
BAR 3 --> 2	30% → 29%	
BAR 2 --> 1	15% → 14%	
BAR 1 --> 0	5% → 4%	
Low Battery Pop-up	4% ~ 15% : One Time popup (No call)	
Critical Low Battery Pop-up	0% ~ 3% : Popup at every level change (No call)	
POWER OFF	0%	

Table. LGP698 battery bar specification

3.11 External memory interface

3.11.1. MSM7227T

The MSM7227 device was designed to provide two distinct memory interfaces. EBI1 was targeted for supporting DDR synchronous memory devices. EBI2 was targeted towards supporting slower asynchronous devices such as LCD, NAND flash, SRAM, NOR flash etc. To support the high-bandwidth, high-density, and low-latency requirements of the advanced on-chip applications, the MSM7227 IC has two high-speed, high-performance memory slave interfaces: the external bus interface 1 (EBI1) and the stack memory interface (SMI). To achieve higher bandwidth and better use of the memory device interface, the SMI accepts multiple commands for the external memory

device. The SMI interface acts as a slave device to all of the bus masters within the MSM device. The masters arbitrate to gain access to the SMI, and upon obtaining the access, they issue commands to the SMI. The bus masters are connected to the SMI through an advanced extensible interface (AXI) bus bridge (or global interconnect block) and communicate over a 64-bit, non-blocking AXI bus protocol. The AXI bus bridge provides the arbitration logic for all of the bus masters.

EBI1 Features
- Support for only low-power memories at 1.8-V I/O power supply voltage
- AXI bus frequencies up to 133 MHz
- A 16-bit/32-bit static and dynamic memory interface

DDR SDRAM interface features include:
- Supports both 32-bit DDR SDRAM devices, up to 133-MHz bus speed
- Supports auto precharge and manual precharge
- Supports partial refresh
- Separate CKE pin per chip-select to support partial operation mode
- Idle power down to save idling power consumption

EBI2 Features
- Support for asynchronous FLASH and SRAM(16bit & 8bit).
- Interface support for byte addressable 16bit devices(UB_N & LB_N signals).
- 2Mbytes of memory per chip select.
- Support for 8 bit/16bit wide NAND flash.
- Support for parallel LCD interfaces, port mapped of memory mapped(8 or 16 bit)

3.11.2.LGP690 External memory Interface

-Multi Chip Package : DDR SDRAM and NAND Flash merged 1 package
-4Gbit Mobile DDR SDRAM / 4Gbit NAND Flash

Interface Spec				
Part Name	Product Gr	Maker	Operation Voltage	Speed
H9DA4GH4JJAMCR-4EM	NAND	SEC	1.8V	45ns
	SDRAM		1.8V	200MHz

3.12 H/W Sub System

3.12.1 RF Interface

3.12.1.1 RTR6285 (WCDMA_Tx, GSM_Tx/Rx)

MSM7227T controls RF part(RTR6285) using these signals.

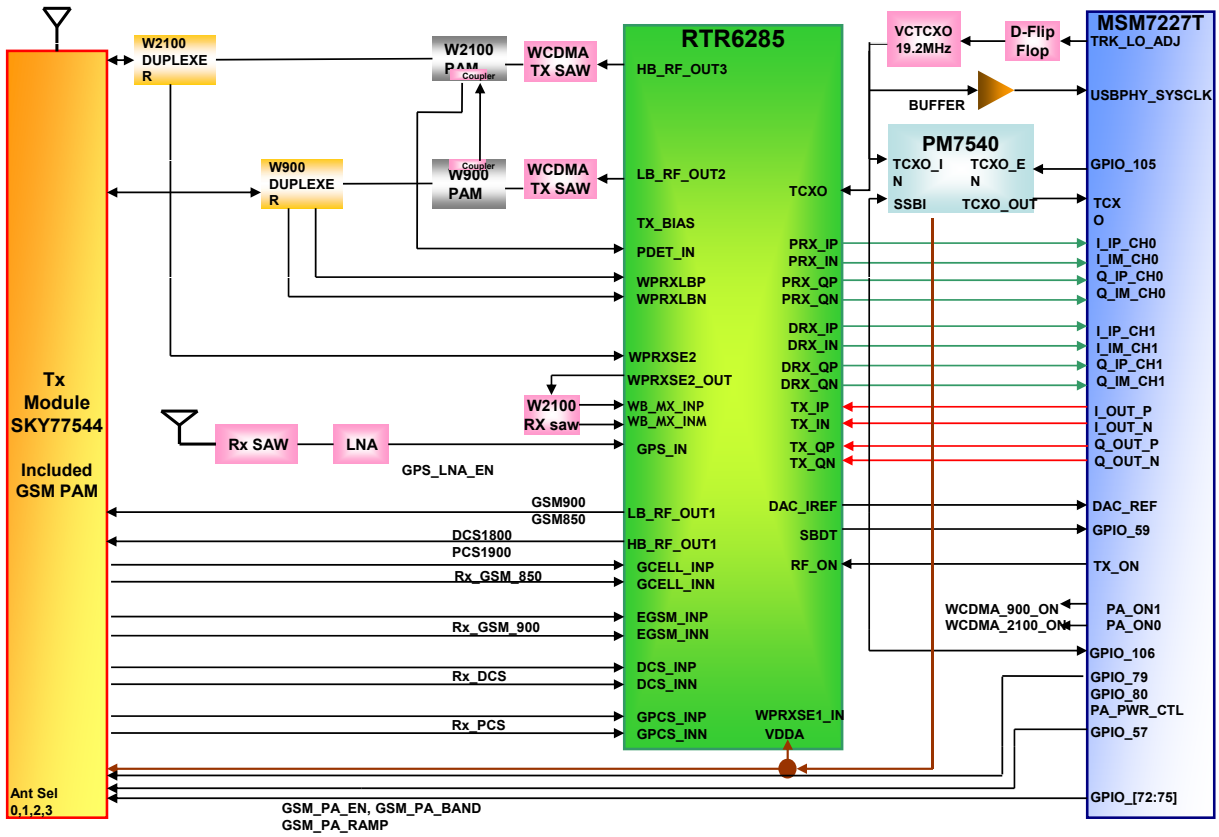
-RTR6285_SSBI : SSBI I/F signals for control Sub-chipset
-RTR_TXON : Power AMP on RF part
-RTR_RX_I/Q_M/P, RTR_TX_I/Q_M/P : I/Q for T/Rx of RF
-RTR_DAC_REF : Reference input to the MSM Tx data DACs

3.12.1.2 The others

TRK_LO_ADJ : TCXO(19.2M) Control
PA_ON0/PA_RANGE0 : WCDMA(2100) TX Power Amp Enable
ANT_SEL[0-3] : Ant Switch Module Mode Selection(WCDMA,GSM Tx/Rx,DCS-PCS Tx/Rx)
GSM_PA_RAMP : Power Amp Gain Control of APC_IC

3.12.1.3 RF2815 (GPS LNA)

* GPS_LNA_EN : GPS LNA Enable Signal (GPS LNA Shutdown)



RF Interface Block Diagram

3.12.1.4 BCM4330FKFFBG (BT / WiFi module)

WiFi

* WLAN_CMD : WLAN SDIO Command Line.
* WLAN_CLK : WLAN SDIO Clock Input.
* WLAN_SDIO[3:0] : WLAN SDIO Data Line.
* WLAN_RESET_N : Low asserting reset for WLAN core.
* WLAN_HOST_WAKEUP : WL_HOST_WAKEUP signal output.

BT

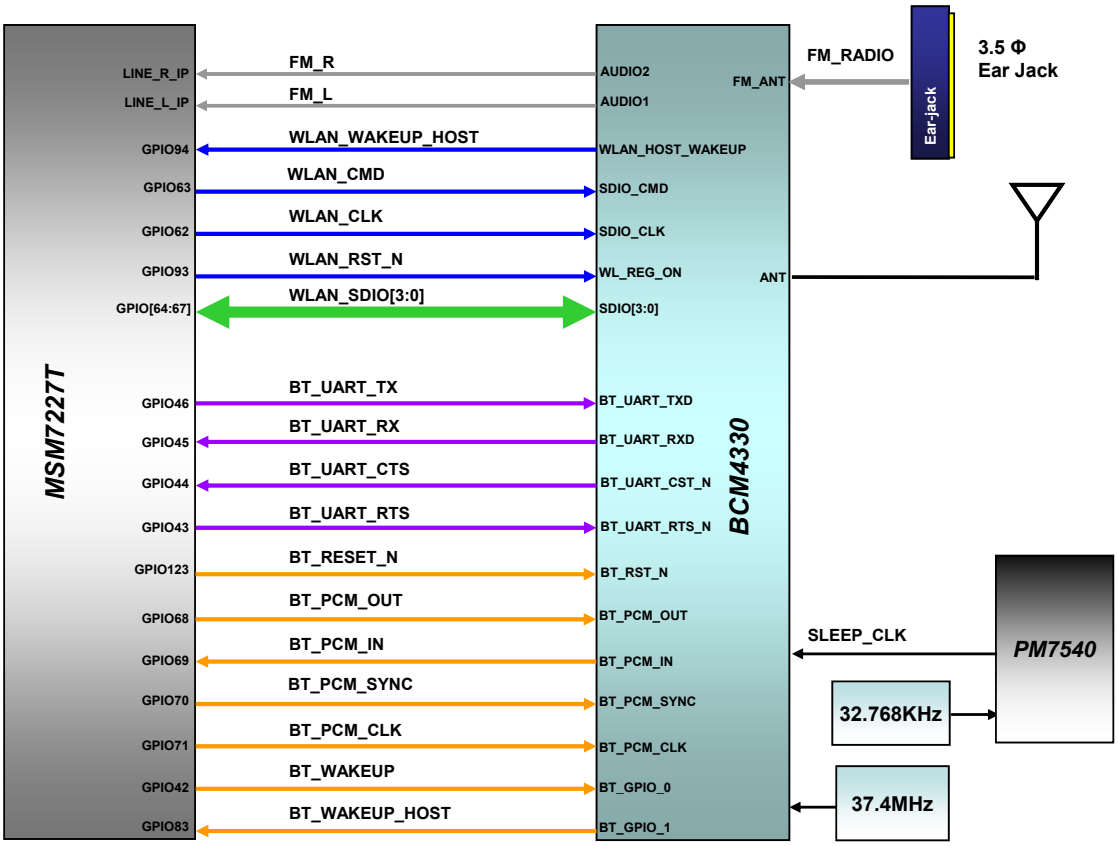
* BT_UART_RX : Bluetooth UART Serial Input.
* BT_UART_RTS : Bluetooth UART Request to Send. Active-low request.
* BT_UART_CTS : Bluetooth UART Clear to Send. Active-low clear.
* BT_UART_TX : Bluetooth UART Serial Output.
* BT_PCM_CLK : BT PCM clock, can be PCM-master (output) or PCM-slave (input).
* BT_PCM_DIN : BT PCM data input.
* BT_PCM_SYNC : BT PCM sync signal, can be PCM-master (output) or PCM-slave (input).
* BT_PCM_OUT : BT PCM data output.
* BT_WAKEUP : BT Wakeup Input.
* BT_HOST_WAKEUP : BT Host Wakeup Output
* BT_RESET_N : Low asserting reset for BT core.

Common

* WLAN_REG_ON : If low the internal regulators will be disabled.
* SLEEP_CLK : LPO clock (32.768kHz) input. Used for low-power mode timing.
* CLK_IN : Crystal amplifier input or frequency reference input.
* CLK_REQ : Crystal Circuit / Reference Clock Enable (active-high)

FM Radio

* FM_ANT : FM RF input.
* SLEEP CLK : External reference oscillator input. (32.768KHz)
* FM_R : Right audio line output – digital input data.
* FM_L : Left audio line output – digital frame synchronization.



Wifi/BT/FM Interface Block Diagram

3.12.2 MSM Sub System

3.12.2.1. USIM Interface

SIM interface scheme is shown in Figure.

And, there control signals are followed

-USIM_CLK : USIM Clock
-USIM_Reset : USIM Reset
-USIM_Data : USIM Data T/Rx

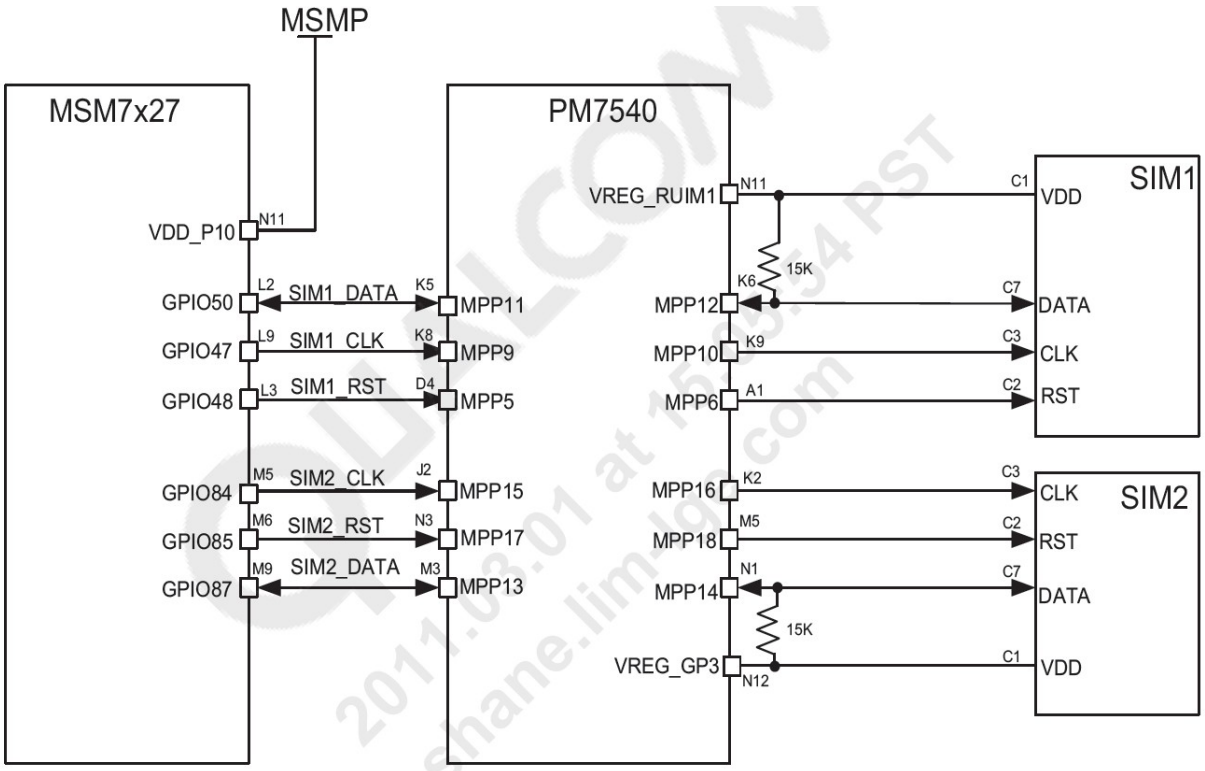


Figure. SIM Interface

3.12.2.2. UART Interface

UART signals are connected to MSM GPIO through IO connector with 115200 bps speed.

GPIO_Map	Name	Note
GPIO_112	UART3_RX	Data_Rx
GPIO_111	UART3_TX	Data_Tx

Table. UART Interface

3.12.2.3 HS-USB

The High-Speed USB module contains an embedded UTMI+ core with a built-in transceiver eliminating the need for an external PHY. The HS-USB port is a standard 4-pin interface that connects directly to the USB connector (USBPHY_DP, USBPHY_DN, USBPHY_ID and USBPHY_VBUS). Two additional pins are required for PHY operations which include an external reference resistor pin (USBPHY_REXT) and a USB system clock pin which the USB PHY uses to lock its internal PLL (SYS_CLK)

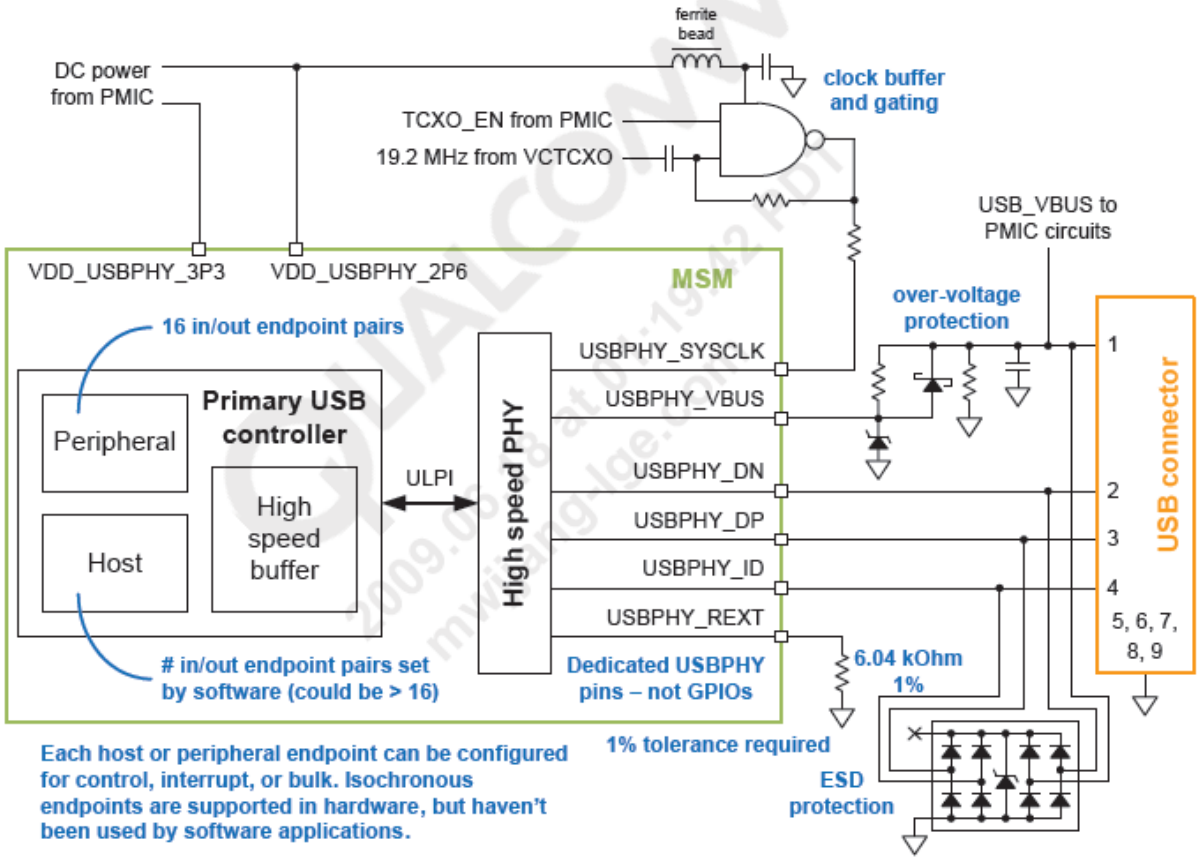


Figure. HS-USB connections and architecture

3.12.3 KEY

3.12.3.1 Side key

There are 3 side key buttons that are controlled by MSM7227T.

Refer to the circuit.

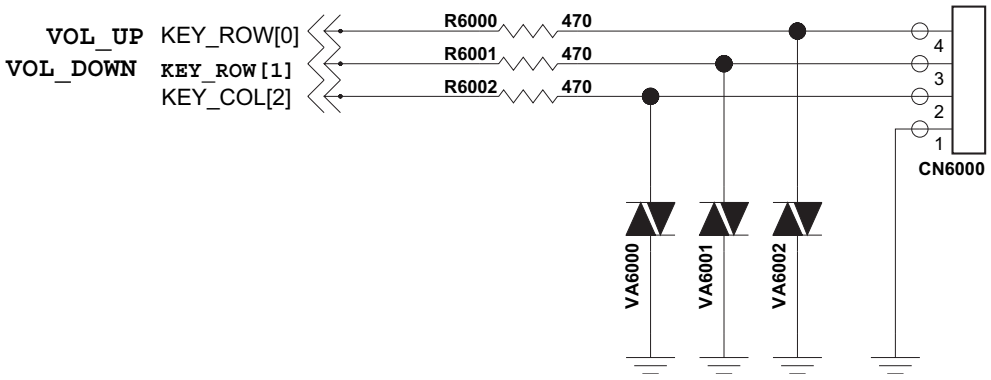


Figure. Volume Side key

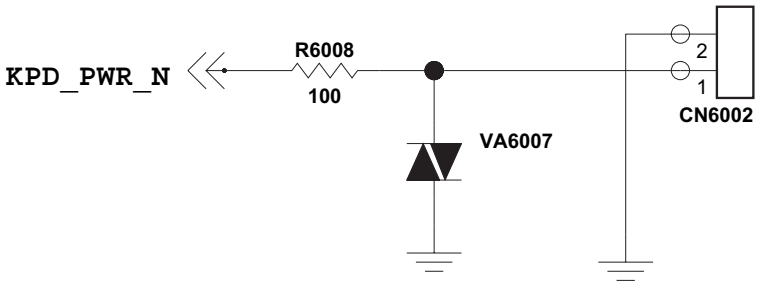


Figure. Power key

3.12.3.3 KEY Backlight

There are 4 White side view LED, 4 white LED in key backlight circuit

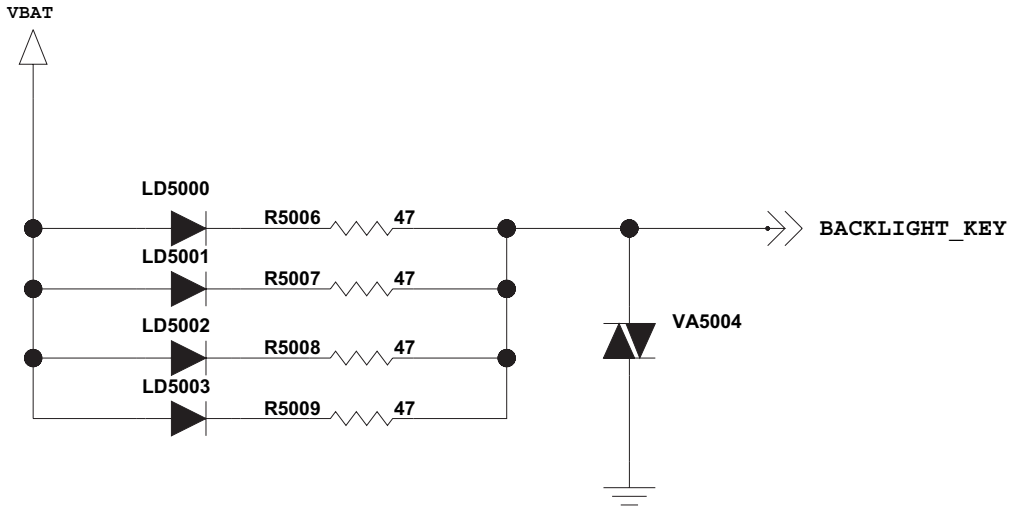


Figure. KEY Backlight

3.13 Audio and sound

3.13.1 Overview of Audio path

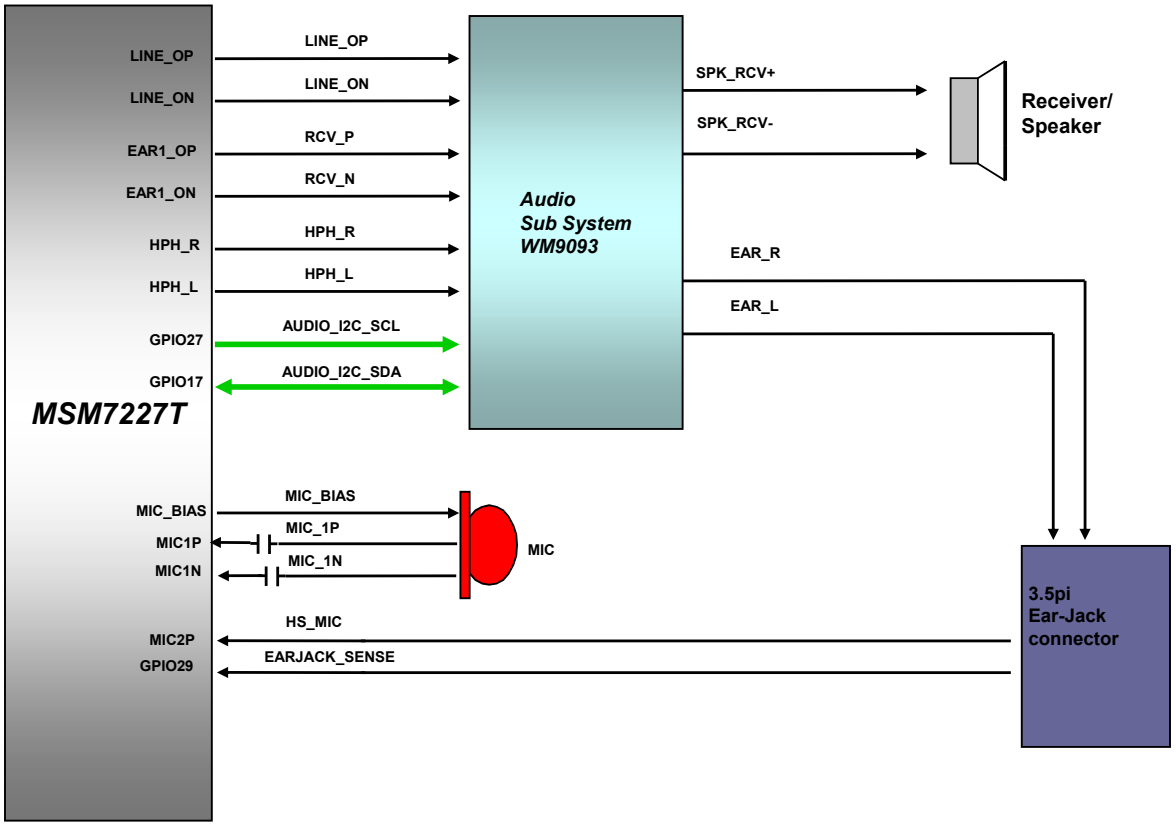


Figure. Block diagram of Audio & Sound path

3.13.2 Audio signal processing & interface

3.13.2.1 MSM7227T audio interface

The MSM7227A audio front end comprises the stereo wideband codec, PCM interface, and additional DSP audio processing. The stereo wideband codec allows the MSM7227 device to support stereo music/ringer melody applications in addition to the 8 kHz voice band applications on the forward link.

In the audio transmit path, the device operates as 13-bit linear converter with software, selectable 8 kHz and 16 kHz sampling rate. In the audio receive path, the device operates as a software-selectable 13-bit or 16-bit linear converter with software selectable 8 kHz,16 kHz, 22.05 kHz, 24 kHz, 32 kHz, 44.1 kHz, or 48 kHz sampling rate. Through software, the Rx path can be configured as either a mono or stereo output. New to the MSM7227 device is a transmit (Tx) ADC path that now supports stereo wideband sampling. The integrated codec contains all of the required conversion and amplification stages for the audio front end. The codec operates as a 13-bit linear codec with the transmit (Tx) and receive (Rx) filters designed to meet ITU-T G.712 requirements.

The codec includes a programmable side tone path for summing a portion of the Tx audio into the Rx path. An on-chip voltage/current reference is provided to generate the precise voltages and currents required by the codec. This circuit requires a single capacitor of 0.1 µF to be connected between the CCOMP and GND pins. The on-chip voltage reference also provides a microphone bias voltage required for electret condenser microphones typically used in handset applications. The MICBIAS output pin is designed to provide 1.8 V DC while delivering as much as 1 mA of current.
Audio decoder summing and headset switch detection are included. The codec interface includes the amplification stages for both the microphone and earphone. On the transmit (Tx) path, the interface supports two differential microphone inputs, a differential auxiliary input, and a stereo line input. On the receive (Rx) path the interface supports one differential earphone output, a stereo single-ended headphone output, one differential auxiliary output, and stereo single-ended line outputs. The codec is configured by the codec SBI registers. The codec interface is shown in Figure.

Also part of the audio front end is the PCM interface. The PCM interface allows for an external codec to be used instead of the internal codec. This interface can be used in I2S mode which will allows for an external stereo DAC to be used. Finally, the audio front end includes additional DSP audio processing that does gains, filtering and other audio processing.

The DSP audio processing is configured through the QDSP5000 command types and is

not directly controlled by the microprocessor.

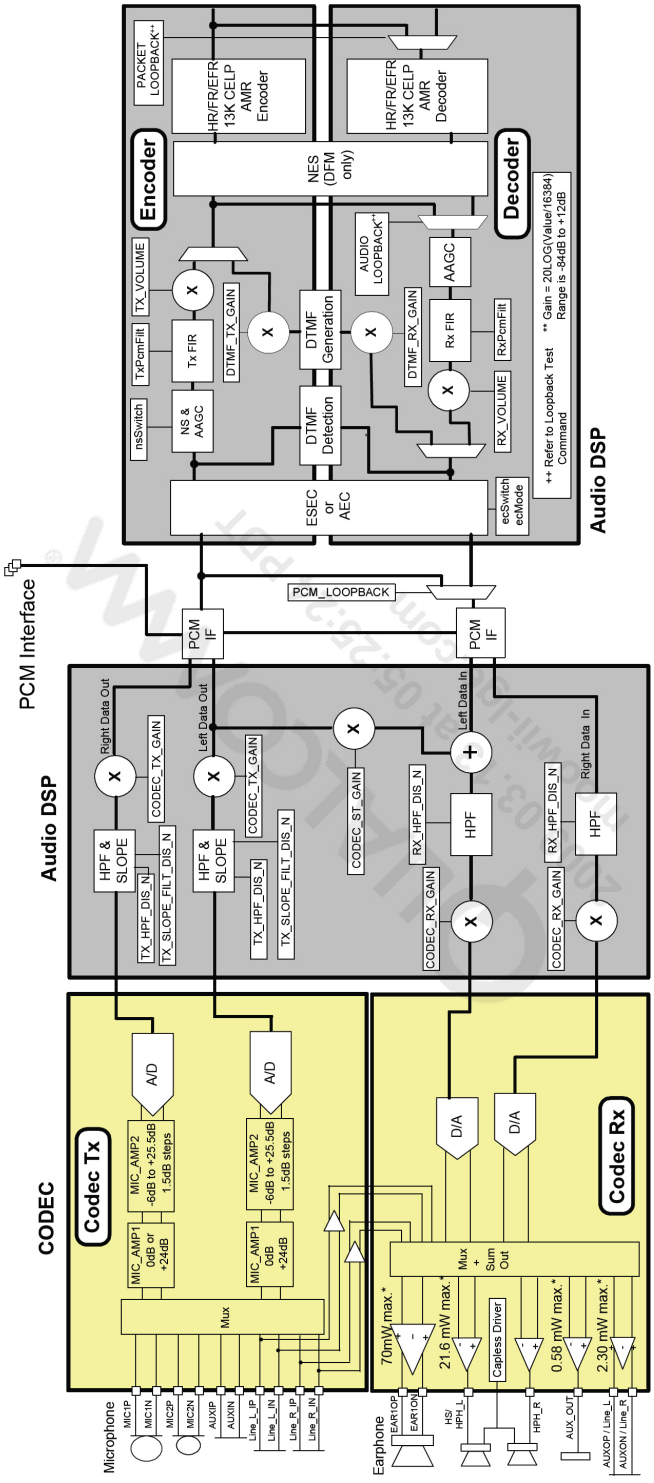


Figure. Detailed diagram of MSM7227T audio interface

3.13.2.2 WM9093 audio interface

The WM9093 is a high performance low power audio subsystem, including headphone driver and Class AB/D earpiece/speaker driver. The Class D speaker driver support 650mV output power at 3.6V, 1%THD.

The unique dual mode charge pump architecture provides ground referenced headphone outputs removing the requirement for external coupling capacitors. Class G technology is integrated to increase the efficiency and extend playback time by optimizing the headphone driver supply voltages according to the volume control.

The flexible input configuration allows single ended or differential stereo inputs. Mixers allow highly flexible routing to the outputs, A 'voice Bypass' path is also available for low-power voice applications.

The WM9093 is controlled using a two-wire I2C interface. An integrated oscillator generates all internal clocks. Removing the need to provide any external clock.

Separate mixer and volume controls are provided for each headphone and speaker driver. Automatic Gain control limits the speaker output signal in order to prevent clipping. DC offset correction to less than 1mV Guarantees a pop/click-free headphone start up.

The WM9093 is available in a 2.0mm × 2.5mm 20-bump CSP package.

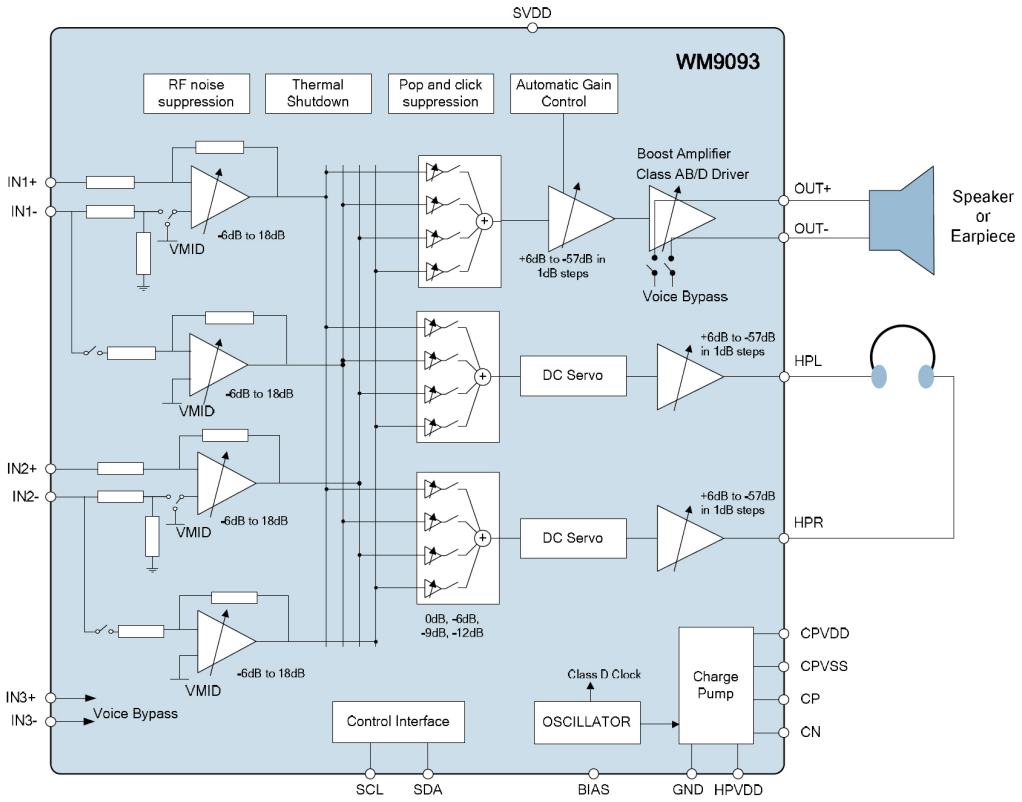
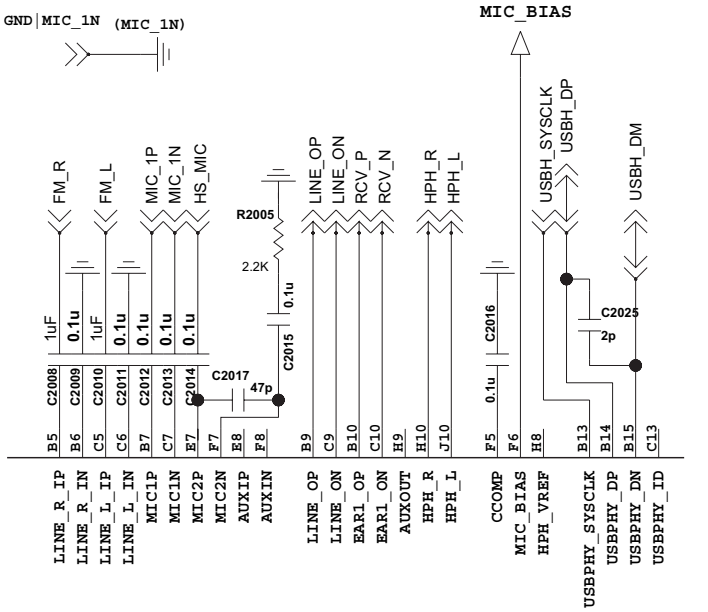
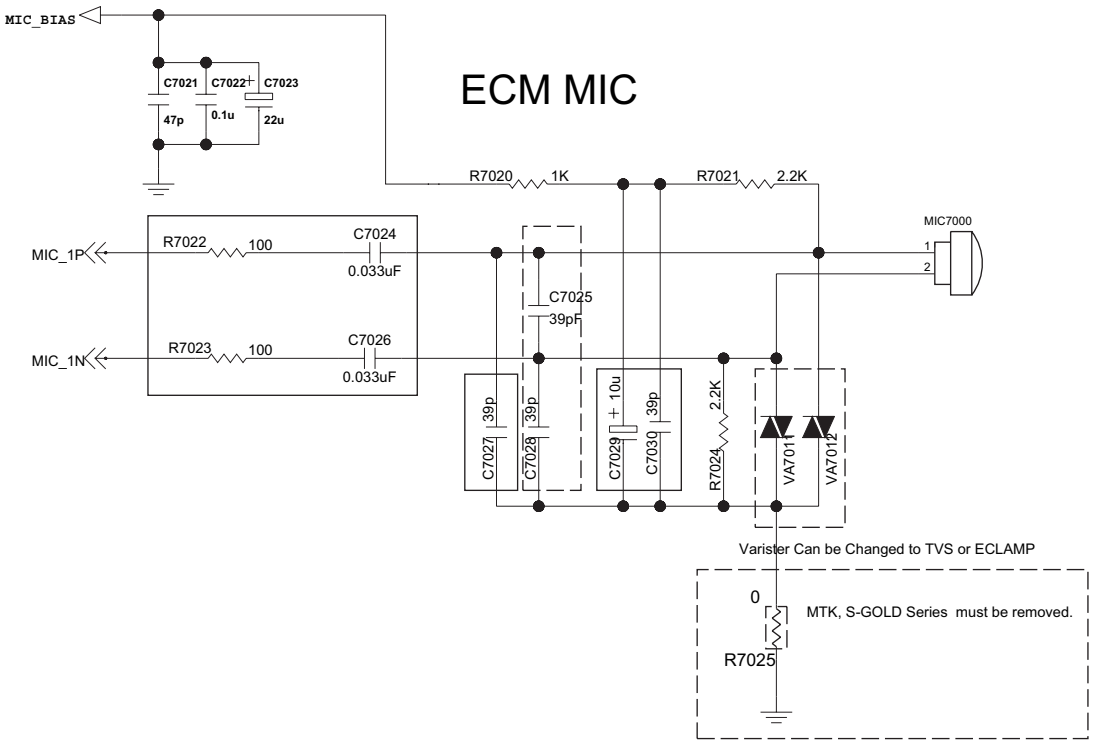


Figure. Detailed diagram of WM9093 audio interface





3.14 Display

LCD module is connected to Main PCB with 24-pin connector.

The LCD is controlled by MDDI Interface in MSM7227T.

1'st Hitachi_3.2" SVLM0041401
2'nd AUO_3.2" EAJ61772101(H320QN01 V0)

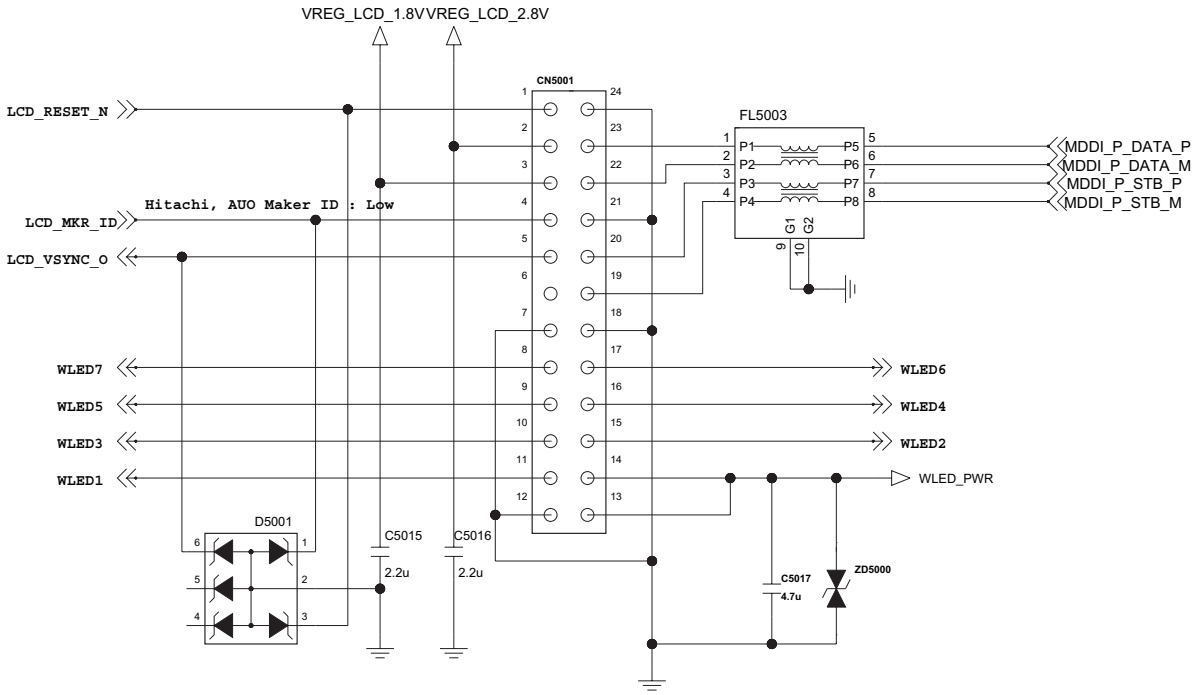


Figure. Schematic of LCD connector (Main Board)

Pin No.	Signal	I/O	Function	Driver's Signal Name
1	RESX	I	Reset	RESX
2	VCI	-	Power Supply for Analog and Voltage booster block	VCI
3	VDD3	-	Power Supply for Interface I/O	VDD3
4	MAKERID(Low)	O	Maker ID (Low : GND level)	-
5	TE	O	Tearing Effect Signal	TE
6	BC	O	Back Light Control of LED Driver	BC
7	GND	-	Ground	-
8	LED7 - Cathode	-	Ground for LED	-
9	LED5 - Cathode	-	Ground for LED	-
10	LED3 - Cathode	-	Ground for LED	-
11	LED1 - Cathode	-	Ground for LED	-
12	GND	-	Ground	-
13	LED - Anode	-	Power Supply for LED	-
14	LED - Anode	-	Power Supply for LED	-
15	LED2 - Cathode	-	Ground for LED	-
16	LED4 - Cathode	-	Ground for LED	-
17	LED6 - Cathode	-	Ground for LED	-
18	GND	-	Ground	-
19	MSN	I	MDDI strobe negative signal	MSN
20	MSP	I	MDDI strobe positive signal	MSP
21	GND	-	Ground	-
22	MDN	I/O	MDDI data negative signal	MDN
23	MDP	I/O	MDDI data positive signal	MDP
24	GND	-	Ground	-

Table. Interface between LCD Module and MAIN Board

3.15 Proximity Sensor

When call connected, the object is moved nearer to the proximity sensor.

LCD backlight and Touch screen is disable operation automatically.

U6003: GP2AP002S00F IC used I2C interface to MSM7227T

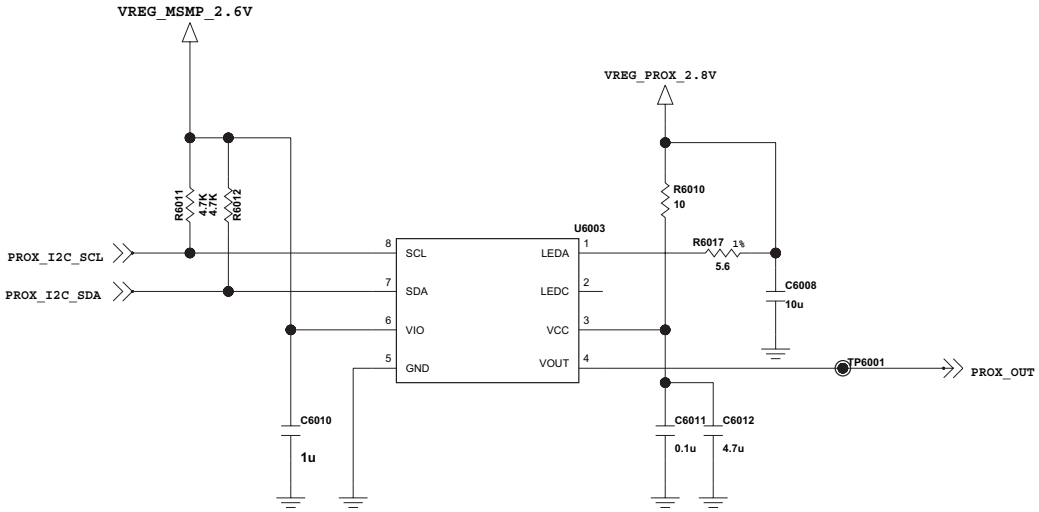


Figure. Proximity Sensor Schematic

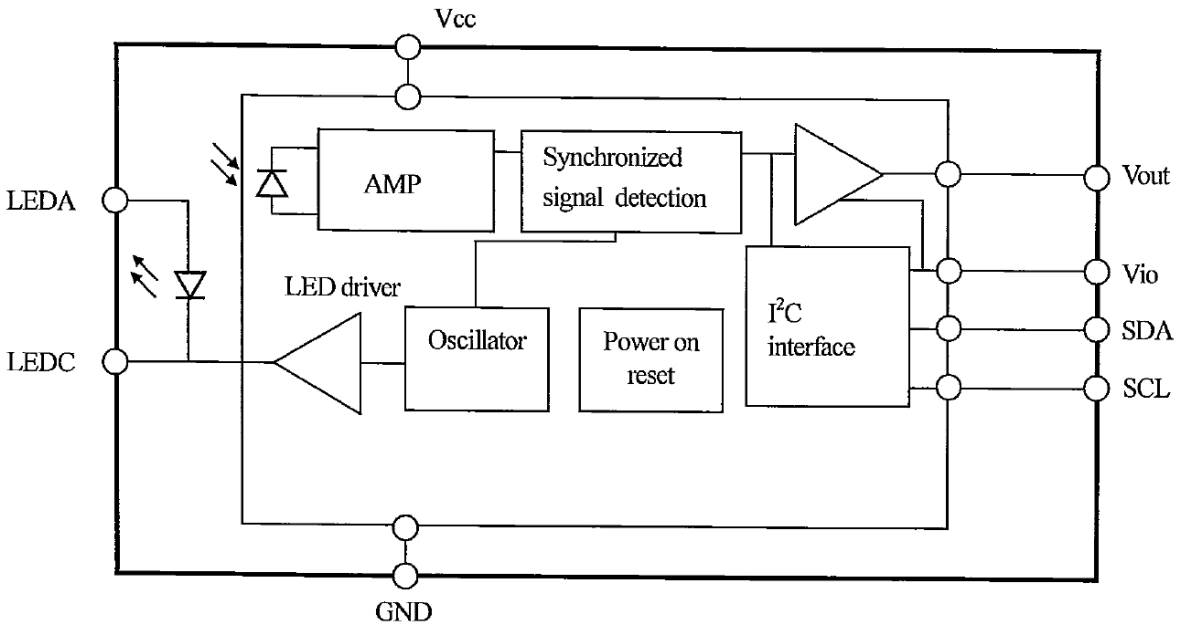


Figure. Proximity Sensor Block Diagram

3.16 Vibrators (DC Motor)

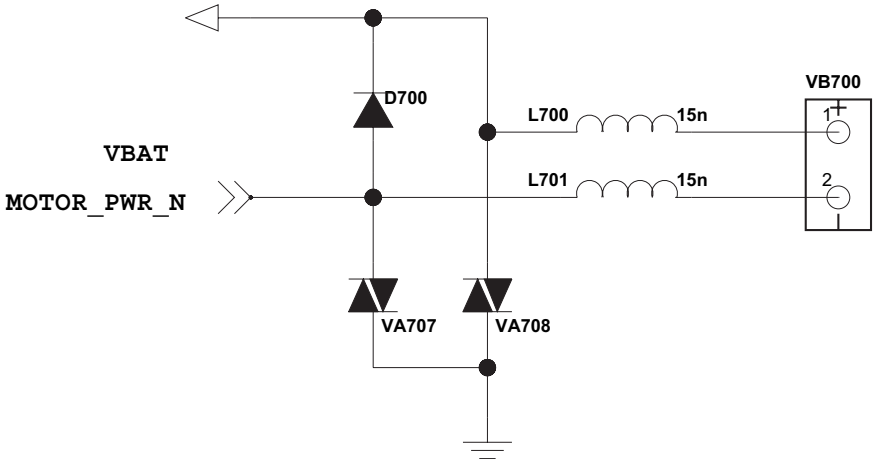


Figure. DC Moter Schematic

3.17 Compass Sensor

If a customer buy the application SW, The Sensor Support a Eletric Compass function

U1 : AMI306 IC used I2C interface to MSM7227T

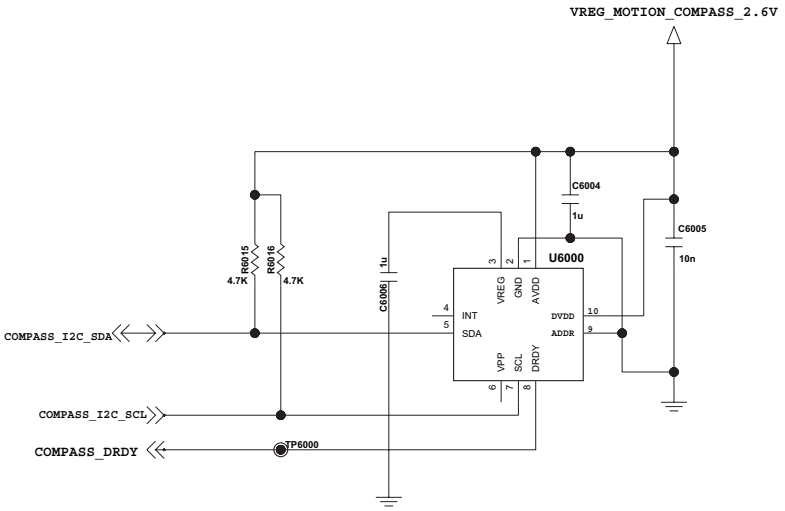


Figure. Compass Sensor Schematic

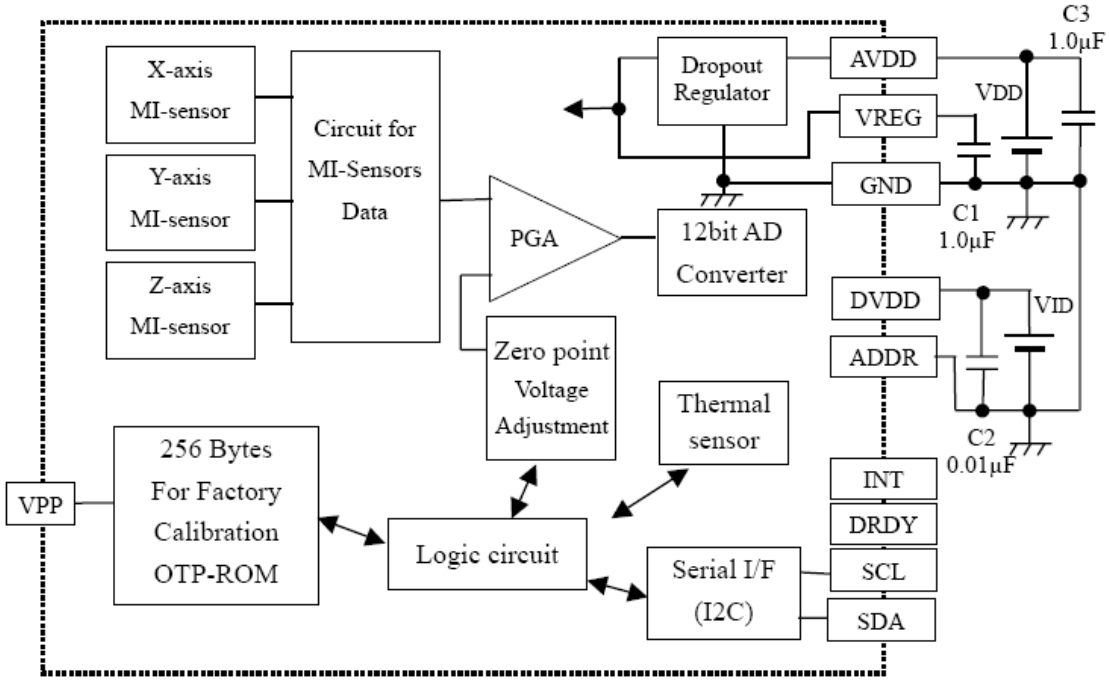


Figure. Compass Sensor Block Diagram

3.18 Motion Sensor

According to tilt the cell phone, the screen is had rotated automatically.

U503 : K3DH IC used I2C interface to MSM7227T

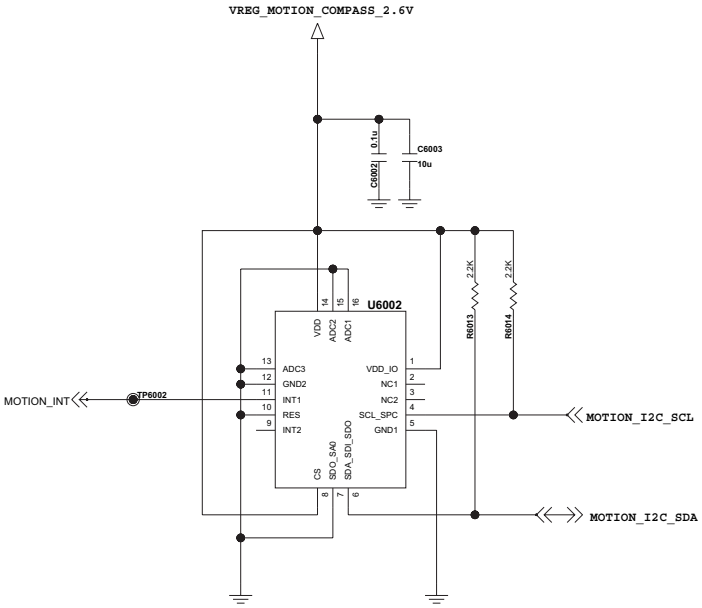


Figure. Motion Sensor Schematic

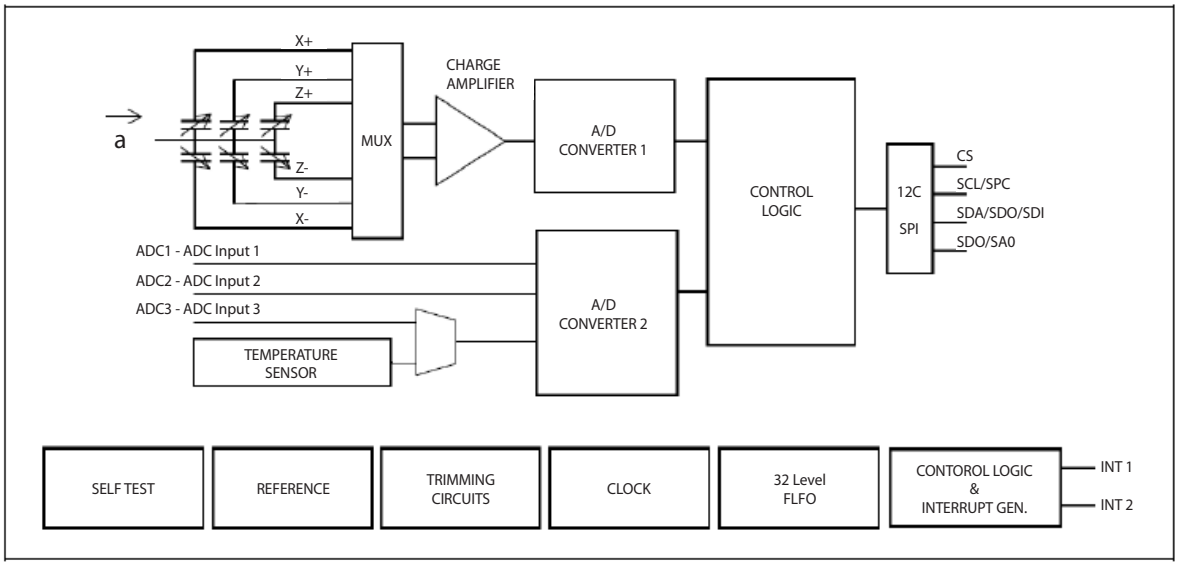


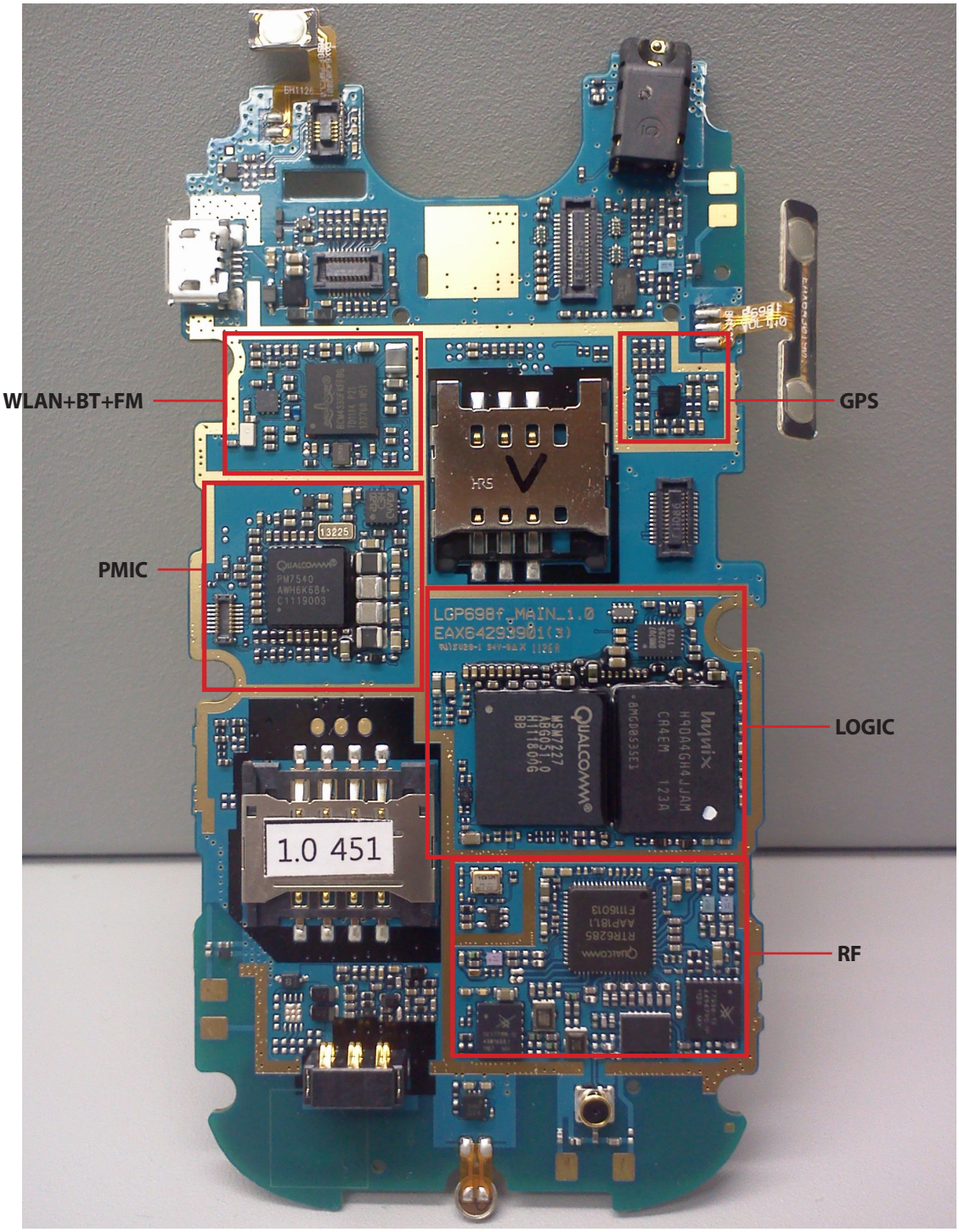
Figure. Motion Sensor Block Diagram

3.19 Main Features

3.19.1 LG-P698 Main Features

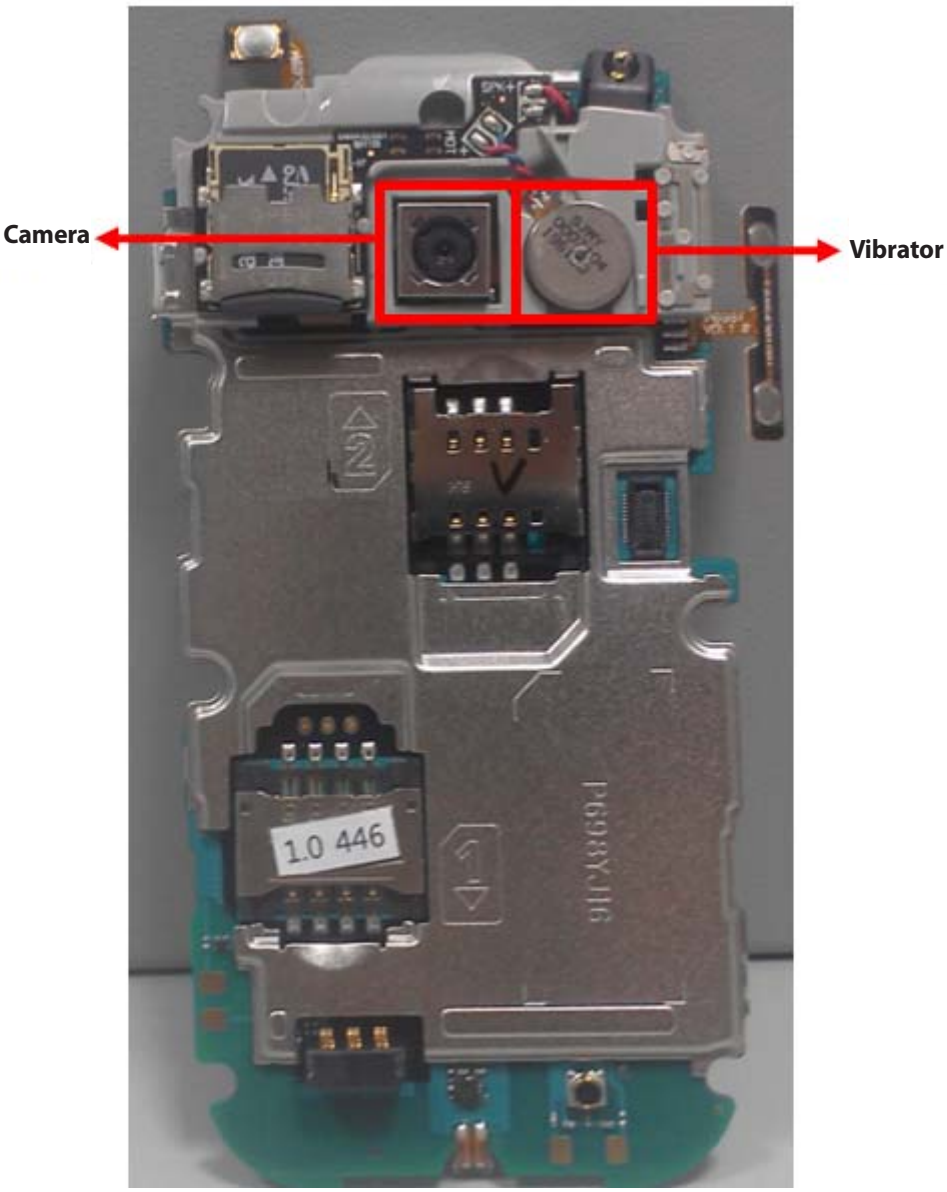
- DOP Type design
- UMTS 2100 + UMTS900+ GSM 900 + DCS 1800 + PCS 1900 + GSM850 based GSM/GPRS/EDGE/UMTS
- HSDPA 3.6Mbps
- TFT Main LCD(3.2' HVGA, 320 x 480)
- Capacitive/Electrostatic Touch Window
- 3M AF Camera
- 3.5Phi Stereo Headset & Speaker phone
- Mobile XMF –Mobile DLS / Scaleable Polyphony
- MP3/AMR/AAC/AAC/WAV/WMA decoder and play
- MPEG4 encoder/decoder and play/save
- JPEG en/decoder
- Supports Bluetooth and HS-USB
- Supports WLAN(802.11b, 802.11g, 802.11n)
- Supports FM Radio
- 1500 mAh (Li-Ion)
- Supports WLAN(802.11b, 802.11g)
- Supports FM Radio
- 1500 mAh (Li-Ion)

3.19.2 LG-P698 Main component (bottom)



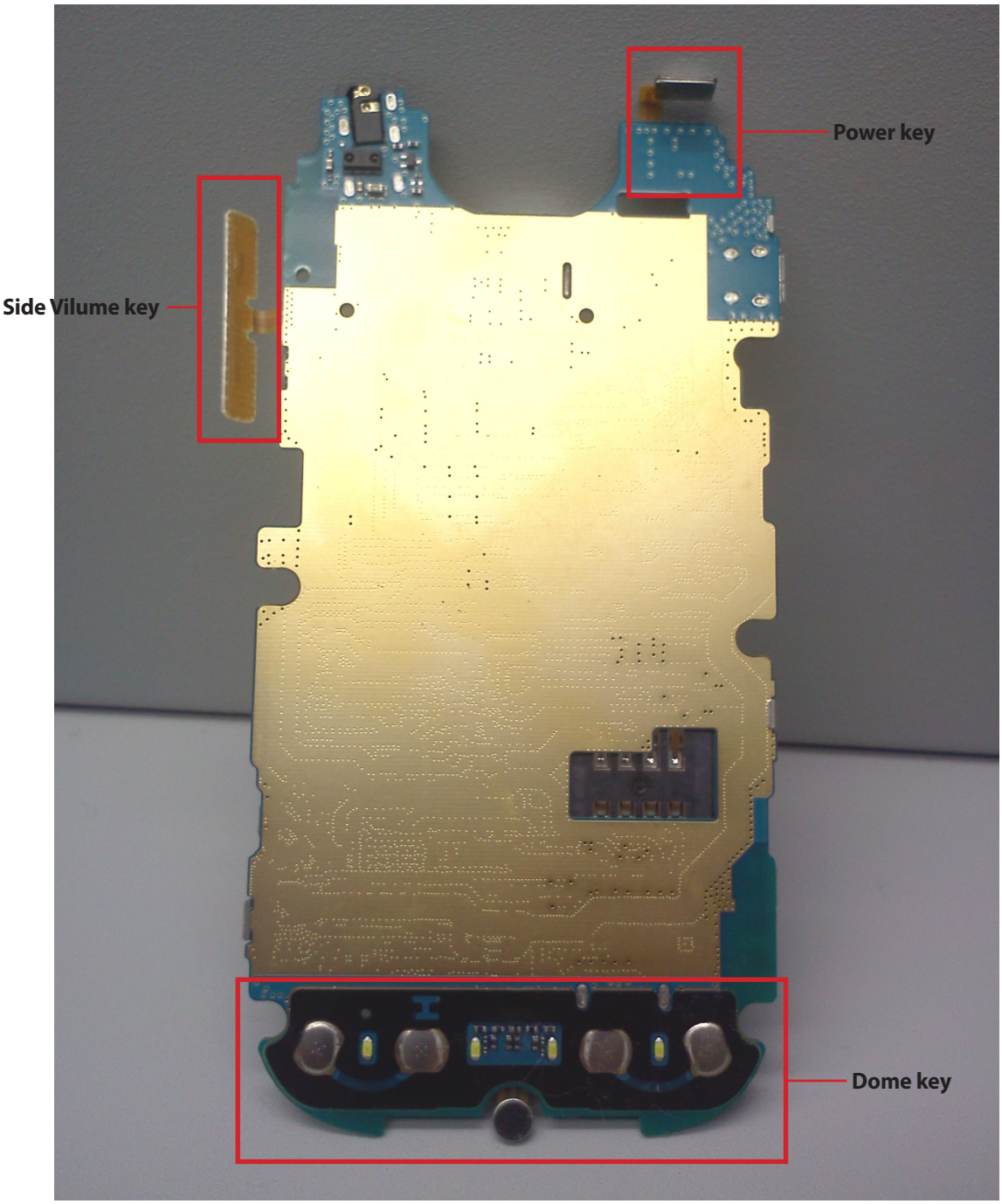
Main Board Bottom

3.19.2. LG-P698 Main component (bottom & Sub carrier)



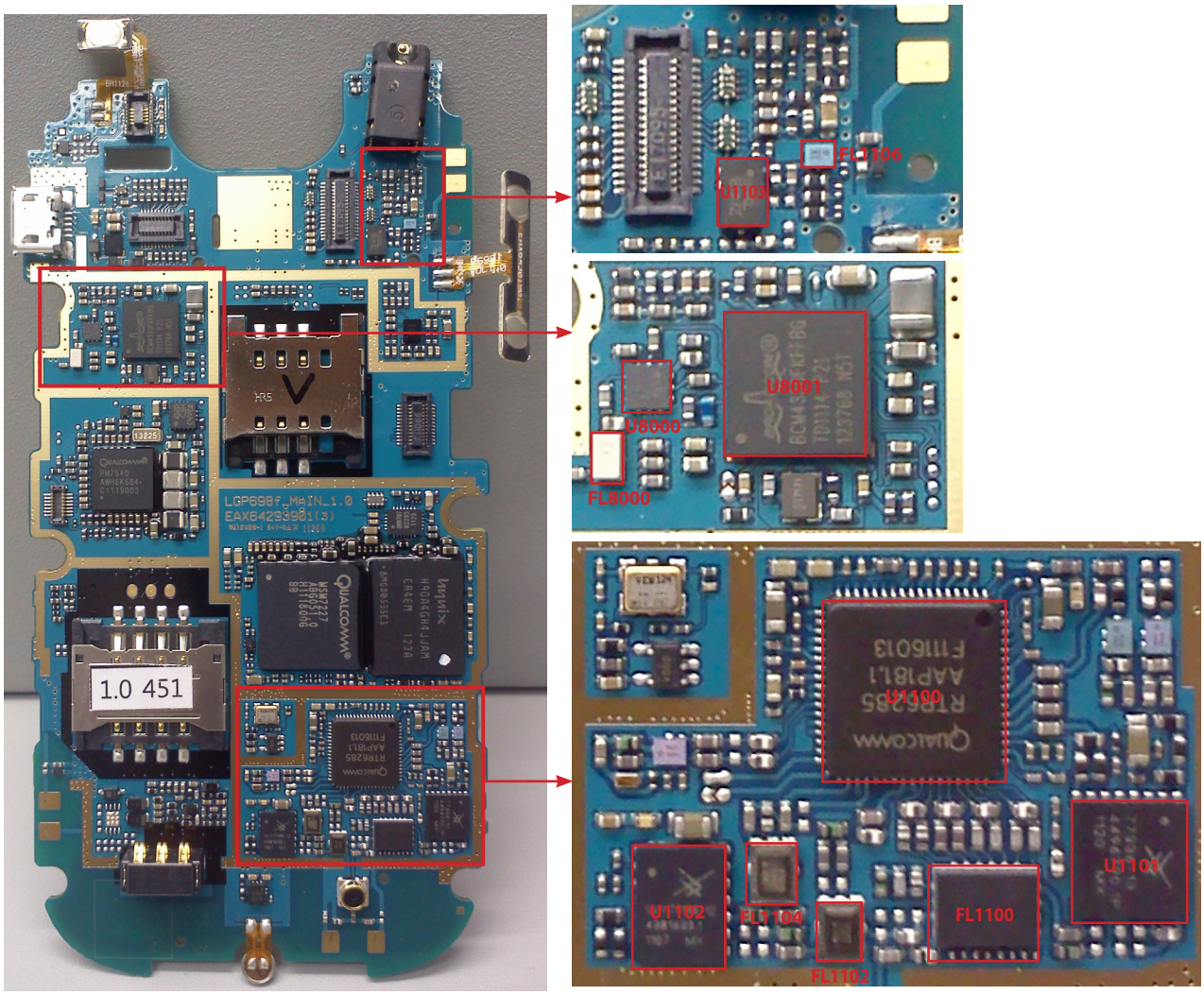
Main Board Bottom & Sub carrier

3.19.2 LG-P698 Main component (Top)



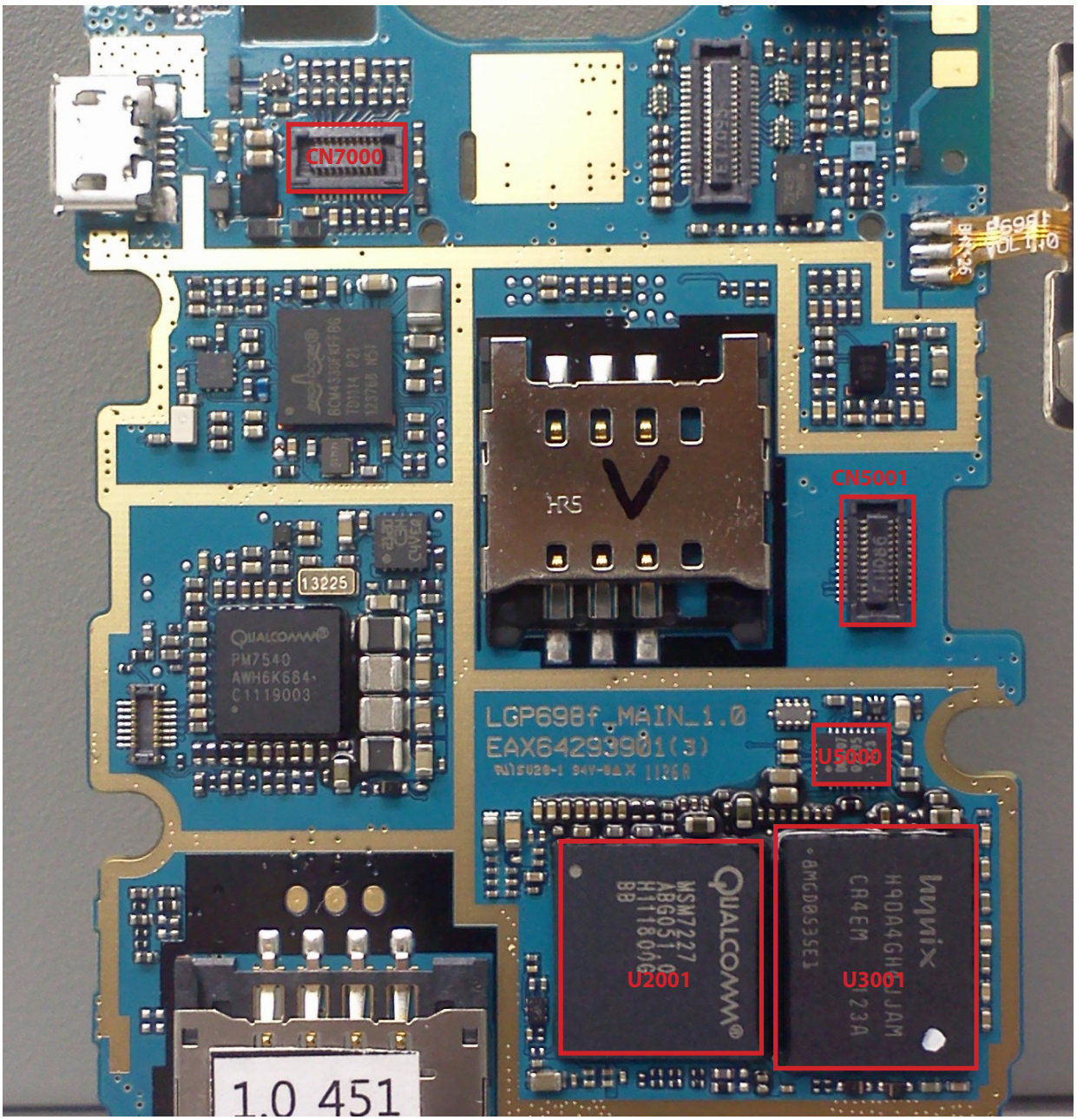
Main Board Top

3.19.3 RF of LG-P698



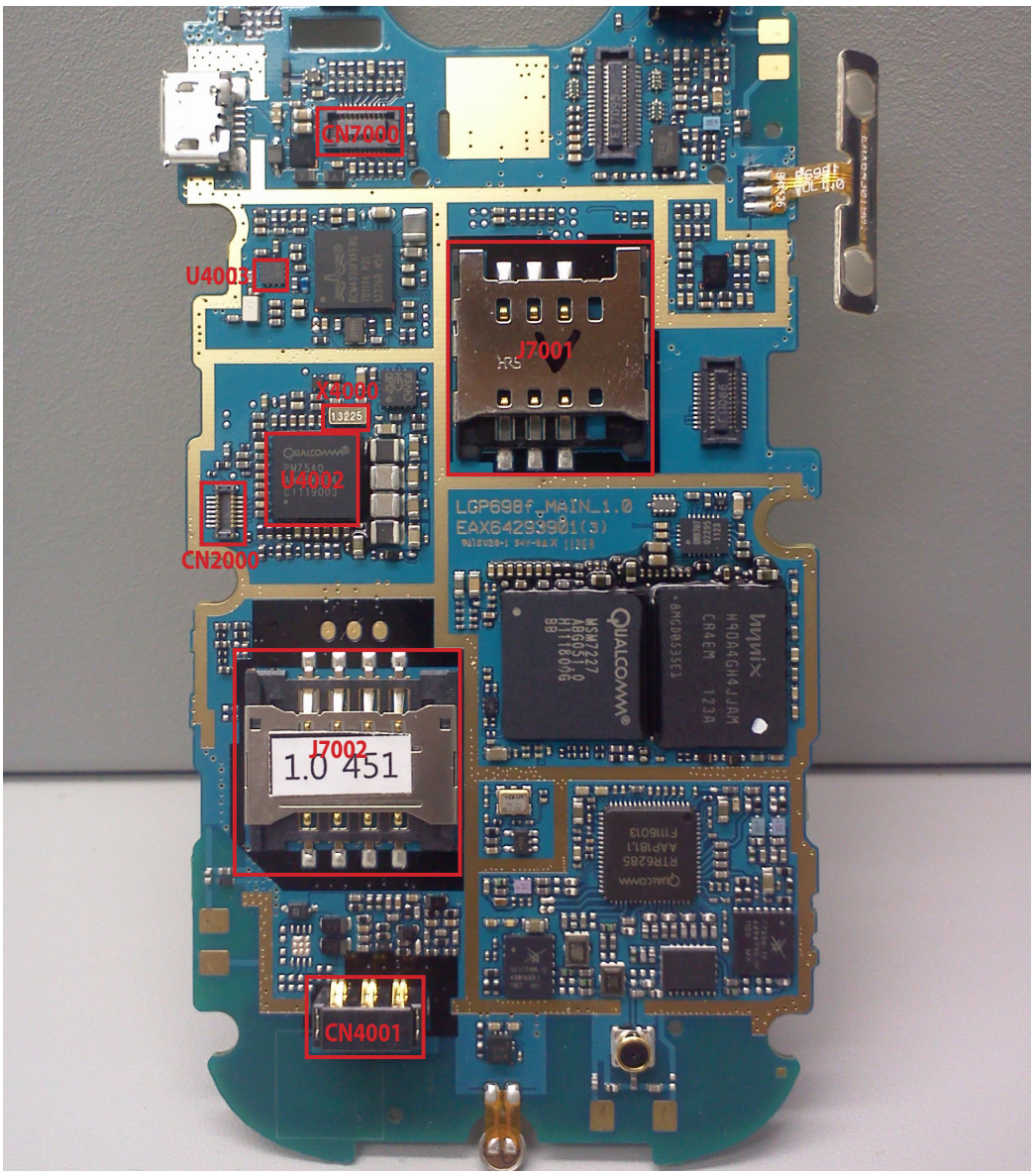
Reference	Description	Reference	Description
U1100	RTR6285(Transceiver)	FL1004	WCDMA Band I Duplexer
U1101	GSM PAM	FL1002	WCDMA Band VIII Duplexer
FL1100	FEM	U8001	BT_WIFI_FM CoB
U1102	WCDMA Band I/VIII DAUL PAM	U8000	BT_WIFI Switch
FL1106	GPS SAW	FL8000	BT_WIFI_2.4GHz SAW
U1103	GPS LNA		

3.19.4 BaseBand of LG-P698



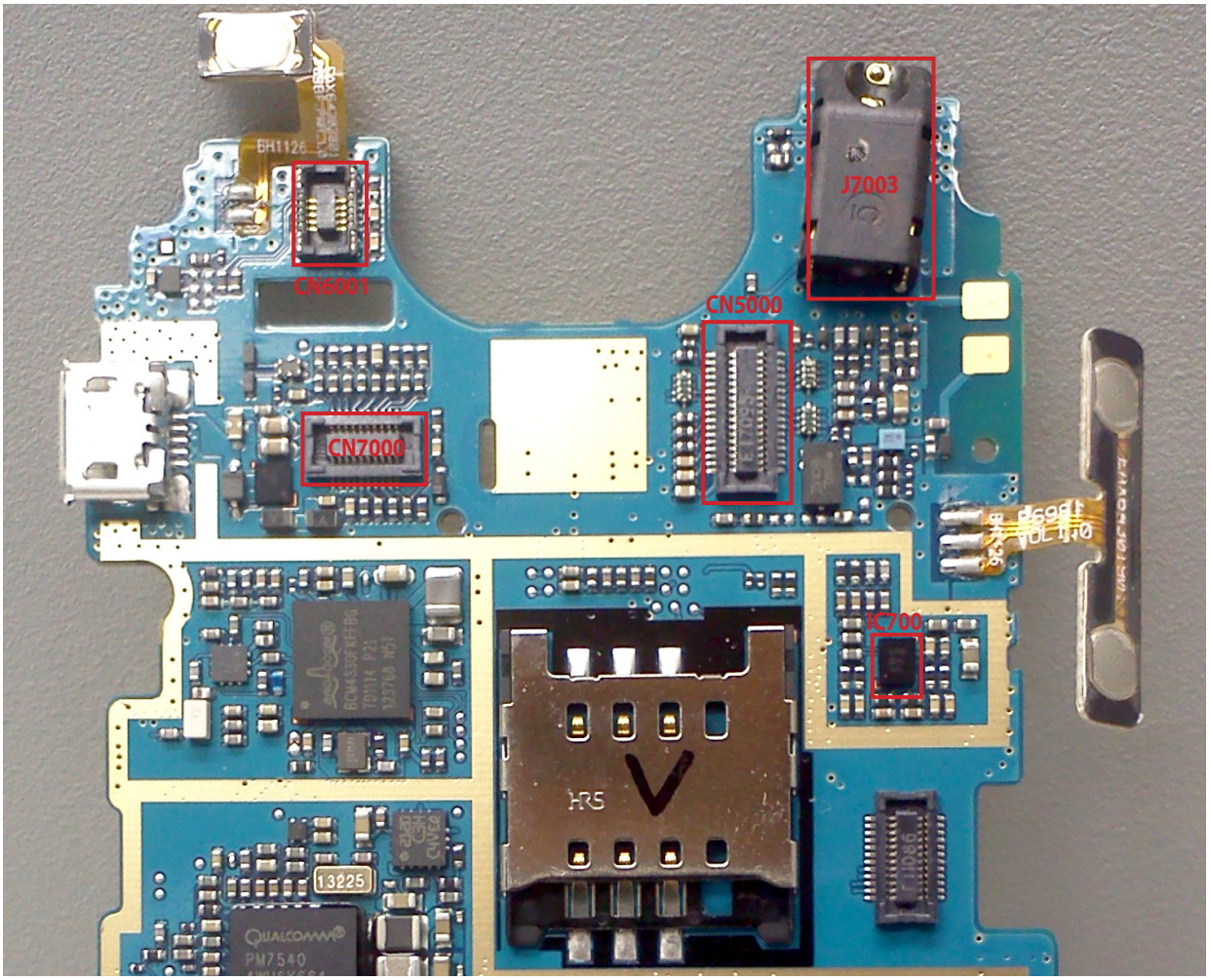
Reference	Description	Reference	Description
U2001	MSM7227T	CN7000	SUB PCB connector for External Memory
CN5001	LCD Connector	U5000	Charge Pump
U3001	4G/4G Memory		

3.19.5 Power and Logic of LG-P698



Reference	Description	Reference	Description
U4003	Mini ABB	J7001	USIM2 Socket
U4002	PM7540	X4000	Crystal
CN2000	JTAG connector	CN4001	Battery Connector
J7002	USIM1 Socket	CN7000	SUB PCB connector for Backup Battery

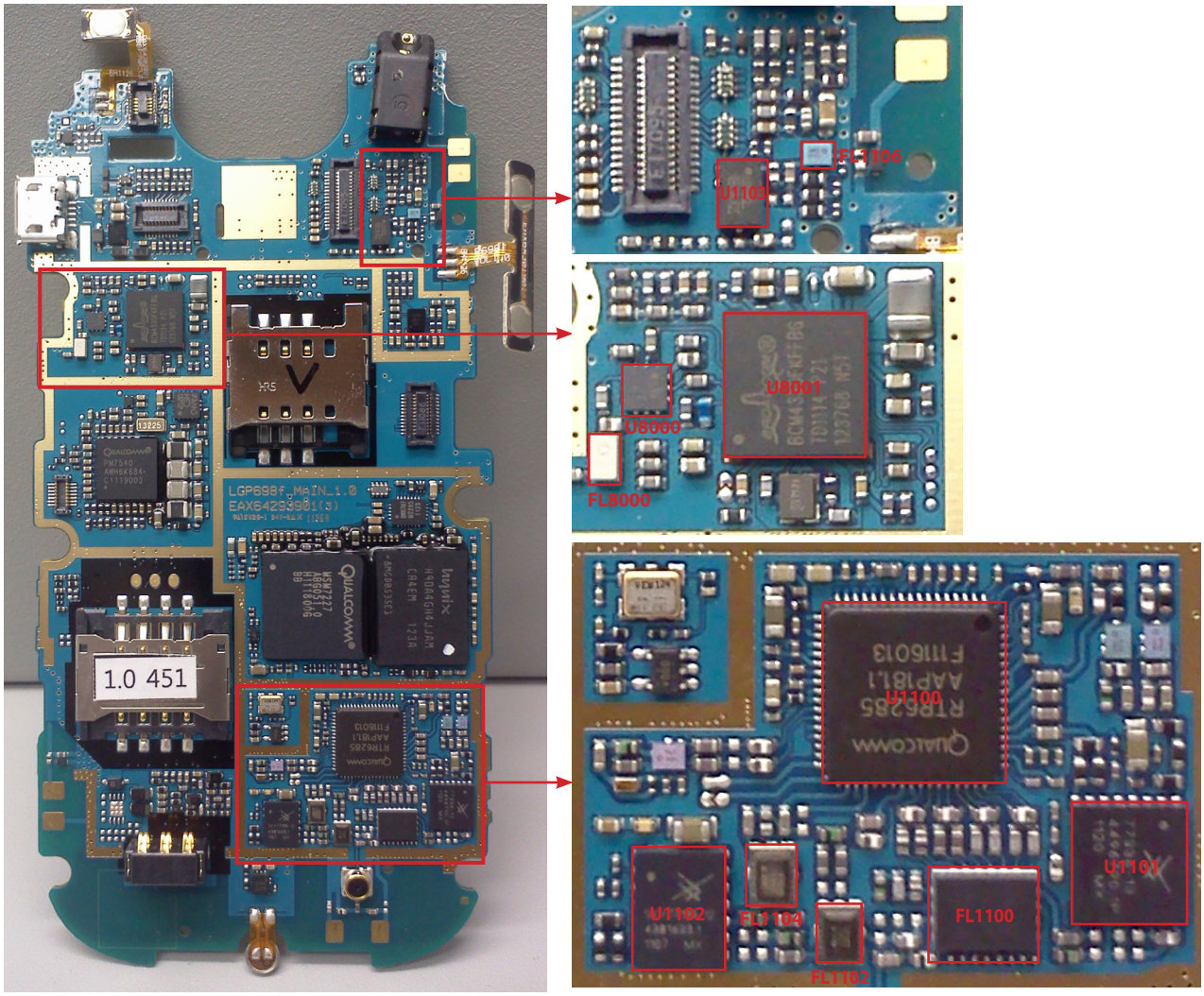
3.19.6 Audio and Camera of LG-P698



Reference	Description	Reference	Description
CN6001	Mini ABB	CN5000	Camera connector
J7003	Ear Jack connector	IC700	Audio Sub system
CN7000	SUB PCB connector for Speaker		

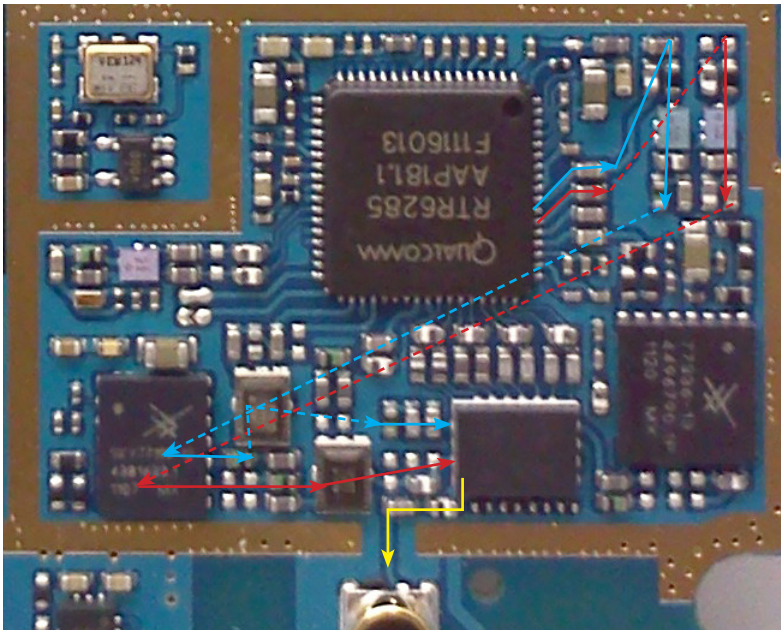
4. TROUBLE SHOOTING

4.1 RF Component



Reference	Description	Reference	Description
U1100	RTR6285(Transceiver)	FL1004	WCDMA Band I Duplexer
U1101	GSM PAM	FL1002	WCDMA Band VIII Duplexer
FL1100	FEM	U8001	BT_WIFI_FM CoB
U1102	WCDMA Band I/ VIII DAUL PAM	U8000	BT_WIFI Switch
FL1106	GPS SAW	FL8000	BT_WIFI_2.4GHz SAW
U1103	GPS LNA		

4.2 SIGNAL PATH

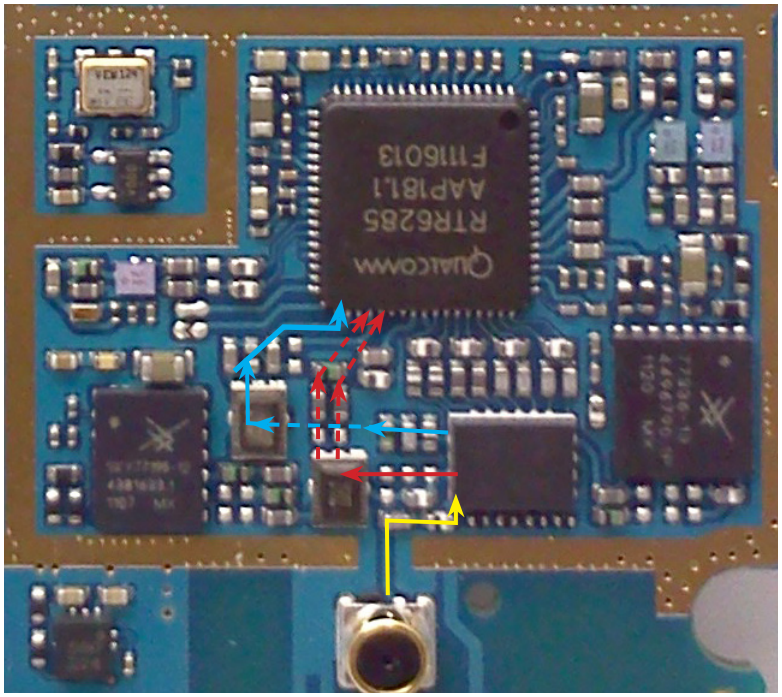


WCDMA I and VIII Band TX Signal PATH

D2. WCDMA 2100 TX PATH

E2. WCDMA 900 TX PATH

COMMON PATH

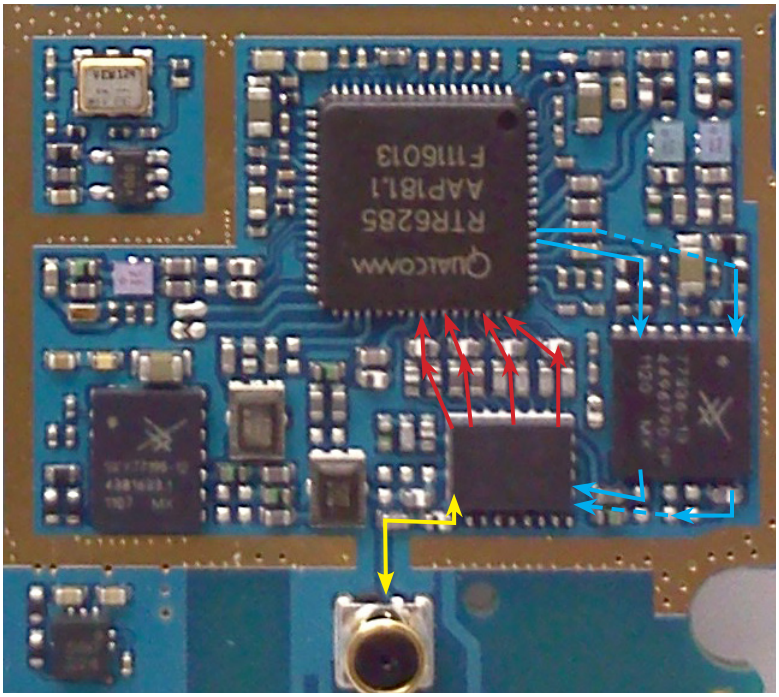


WCDMA BAND I and VI RX Signal PATH

D1. WCDMA 2100 RX PATH

E1. WCDMA 900 RX PATH

COMMON PATH



GSM850/GSM900/DCS/PCS's RX/TX Signal PATH

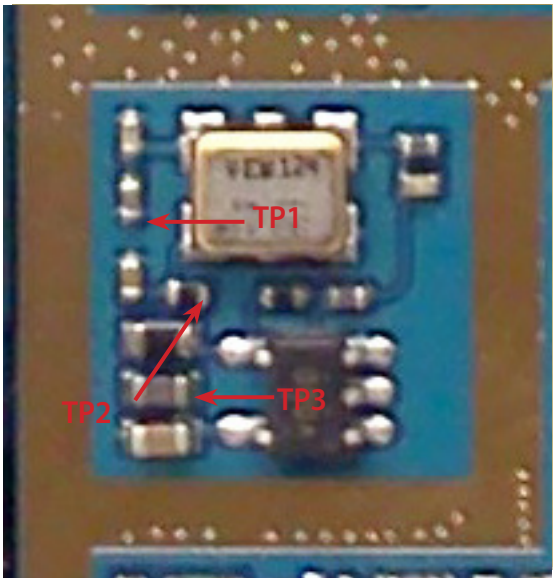
A. GSM850/GSM900/DCS1800/PCS1900 RX PATH

B. GSM850/GSM900/DCS1800/PCS1900 TX PATH

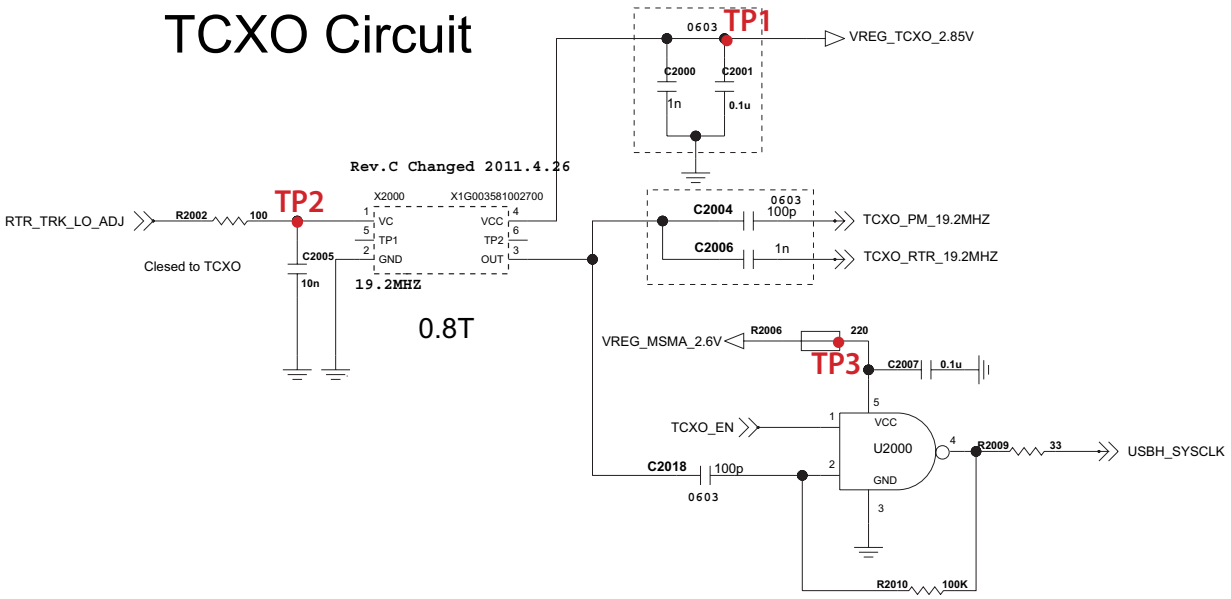
C. COMMON TX/RX PATH

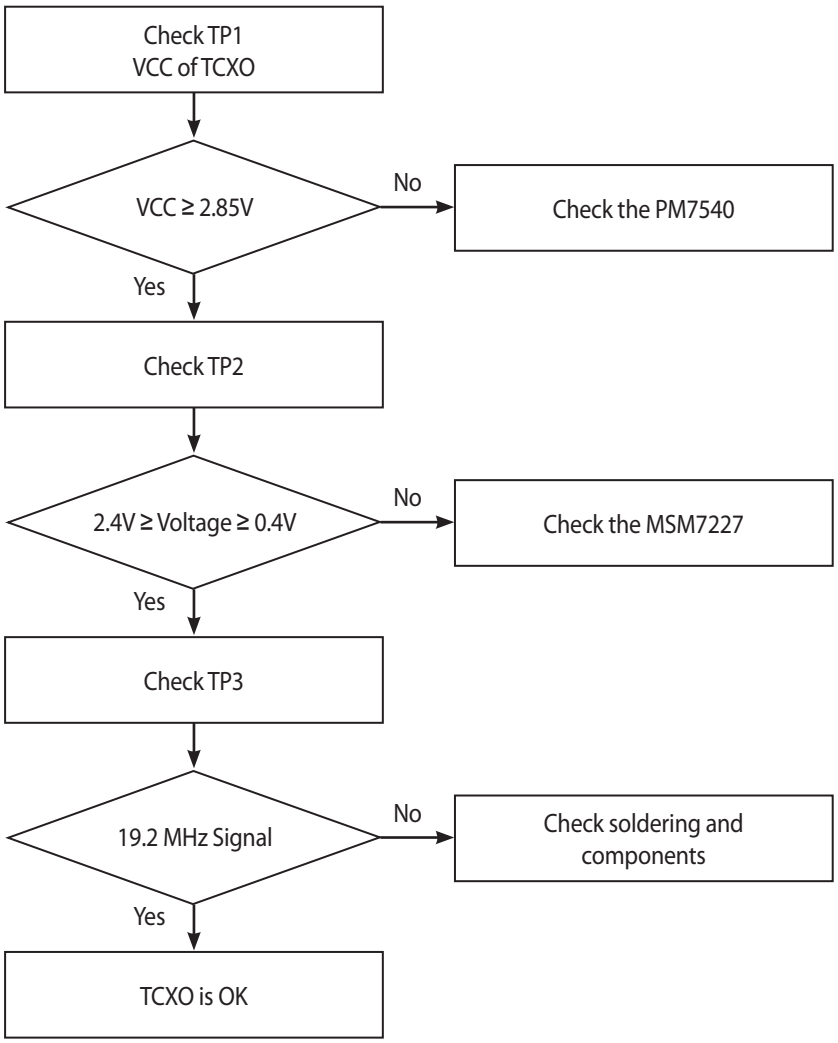
4.3 Checking TCXO Block

The output frequency (19.2MHz) of TCXO (X200) is used as the reference one of RTR6285 and PM7540 internalVCO.

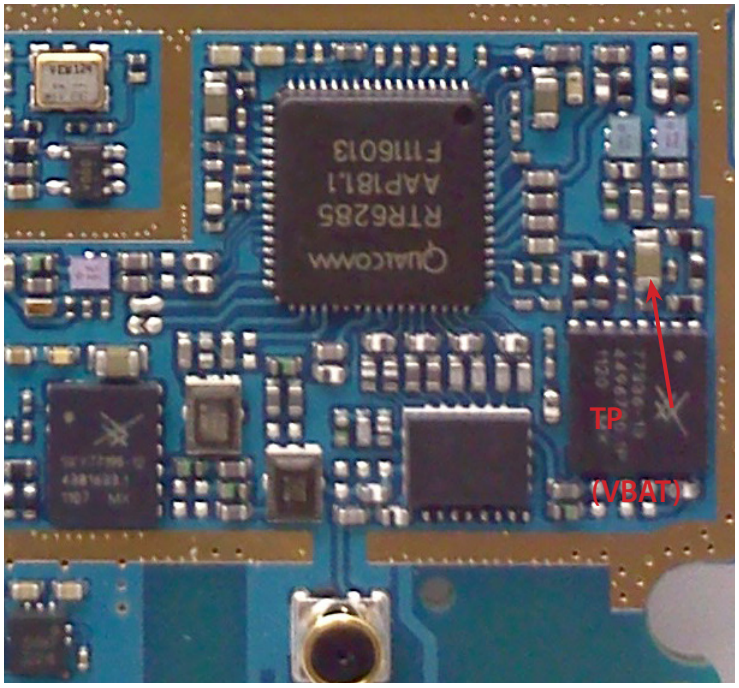


Schematic of the Crystal Part(19.2MHz)

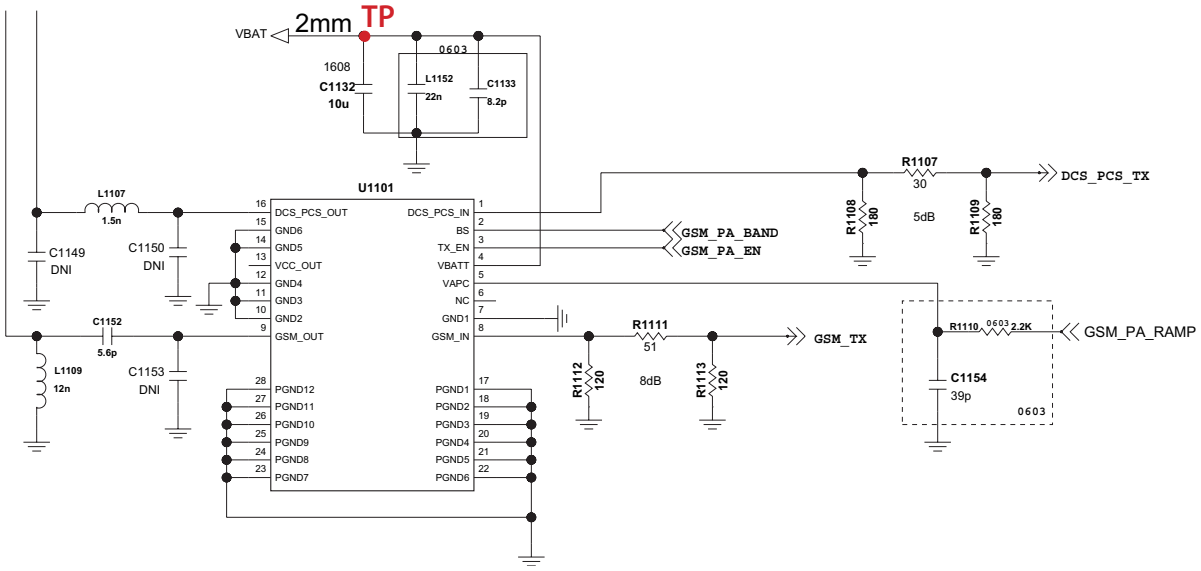




4.4 Checking GSM PAM Block

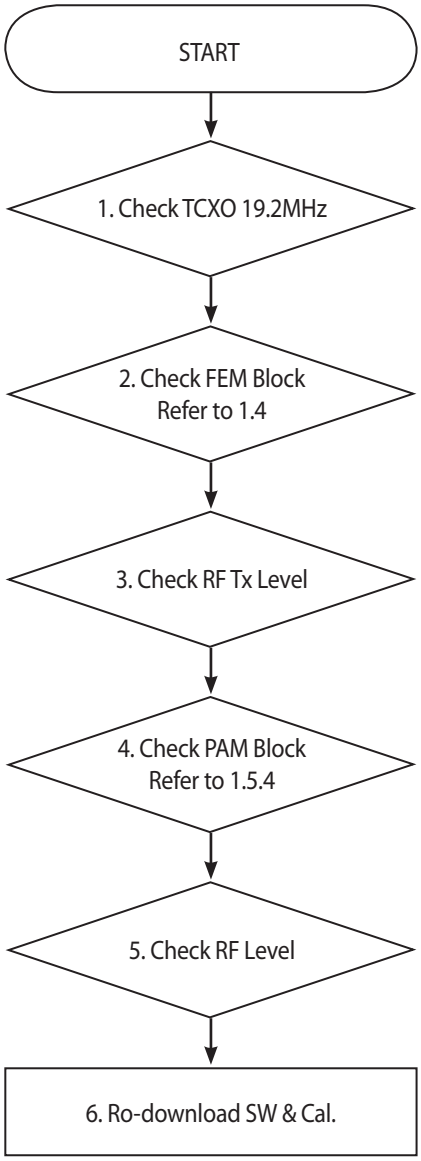


Schematic of the Antenna Switch Block



IF GSM is not working, check the VBAT level.

4.5 Checking WCDMA Block



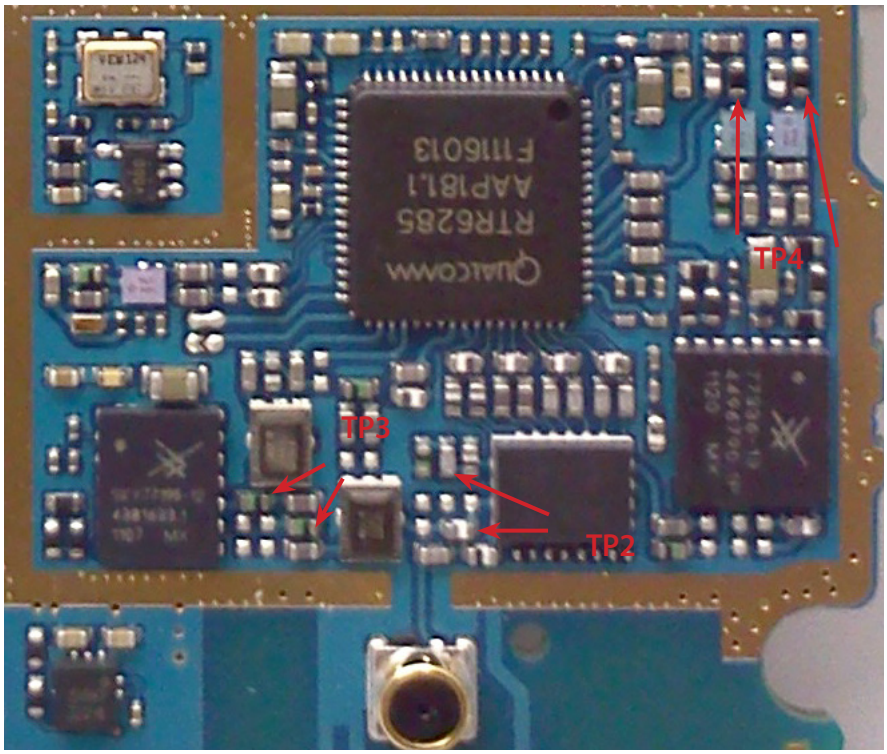
4.5.1 Checking TCXO Block

Refer to 1.3

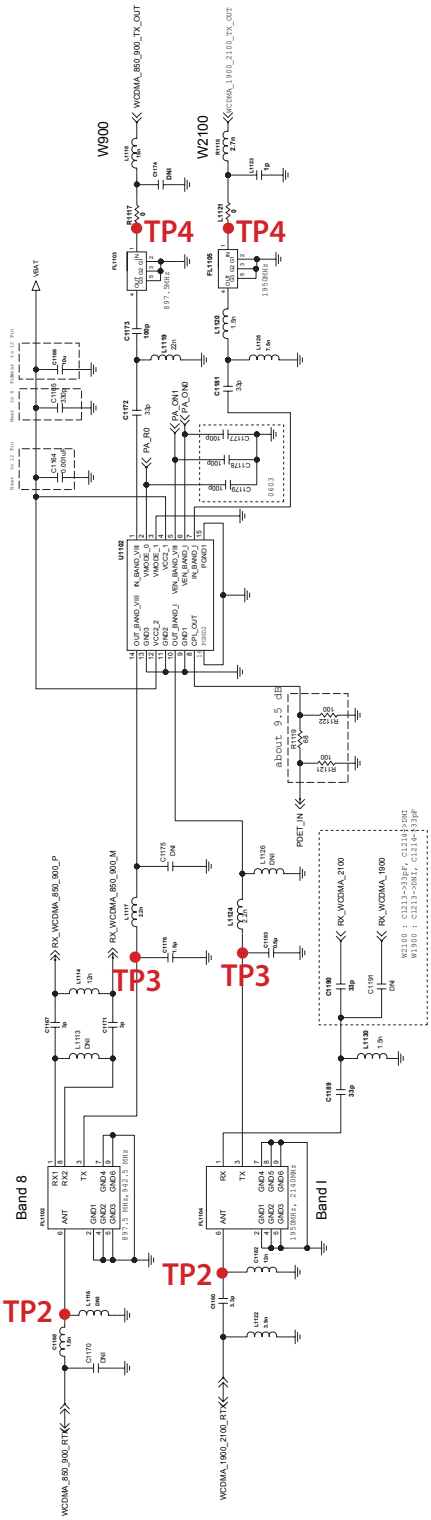
4.5.2. Checking FEM Block

Refer to 1.4

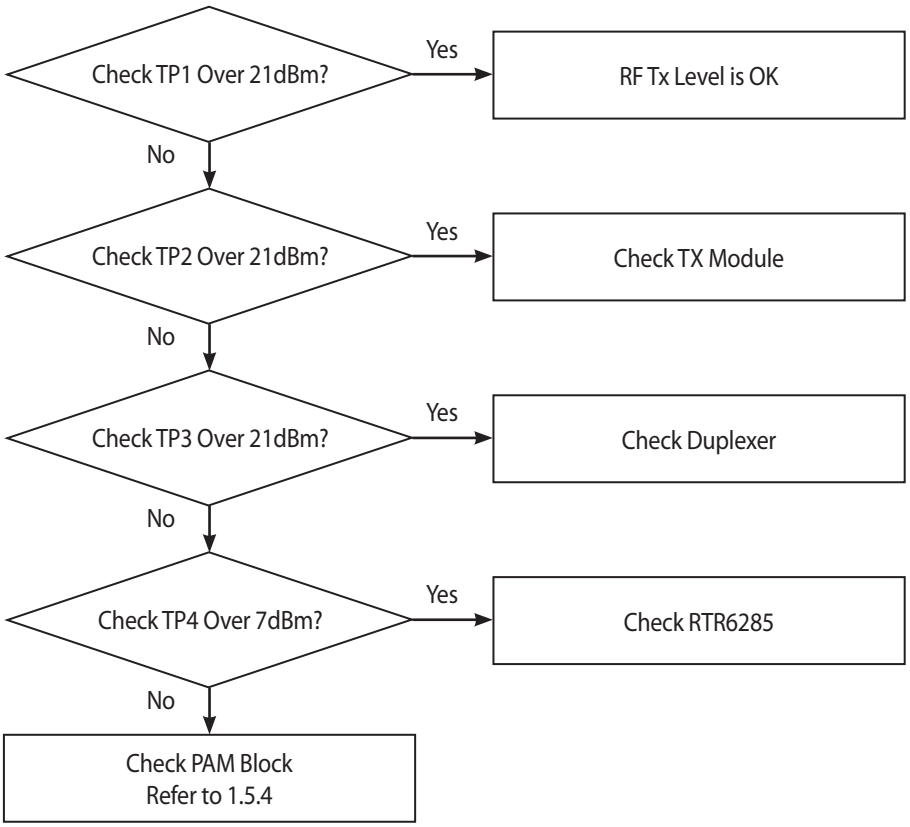
4.5.3. Checking RF TX Level



Test Point (TX Level)



For testing, Max power output is needed.



RTR6285 Maximum output Power = 7 dBm
RTR6285 minimum output Power = -80 dBm
PAM(SKY77195) = Maximum input Power = 10 dBm

4.5.4. Checking PAM Block

PAM control signal

W_PA_ON (W_850_PA_ON(C1178), W_2100_PA_ON(C1177) and) : PAM Enable

W_PA_RO: PAM Gain Control

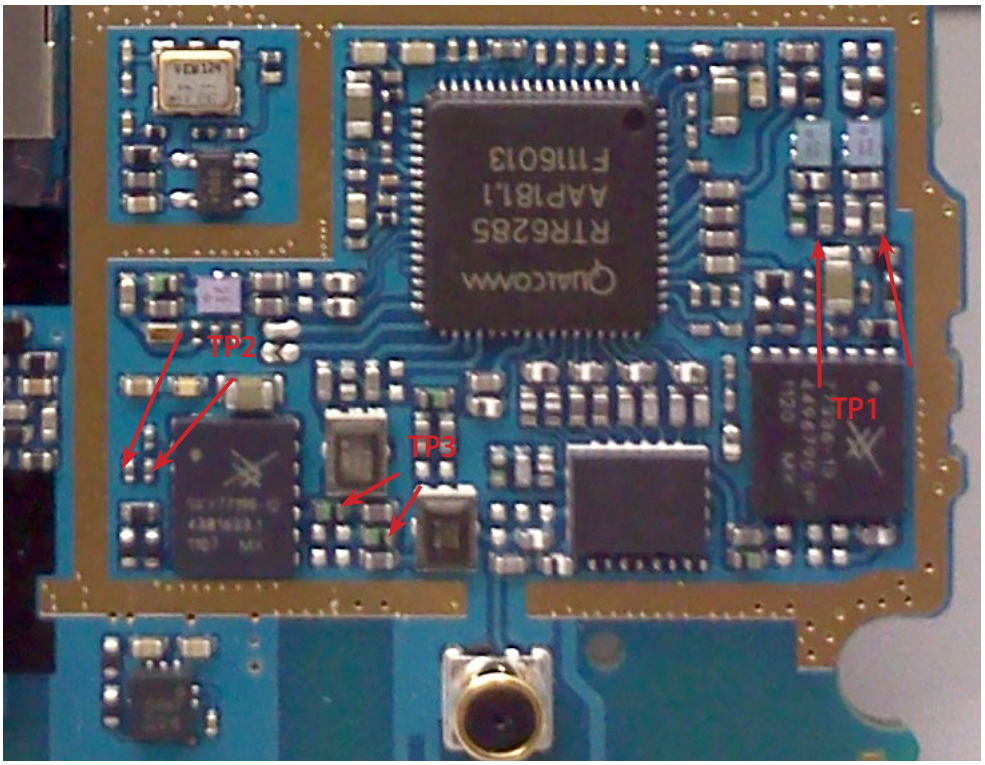
W_PA_ON must be HIGH (over 2.6V)

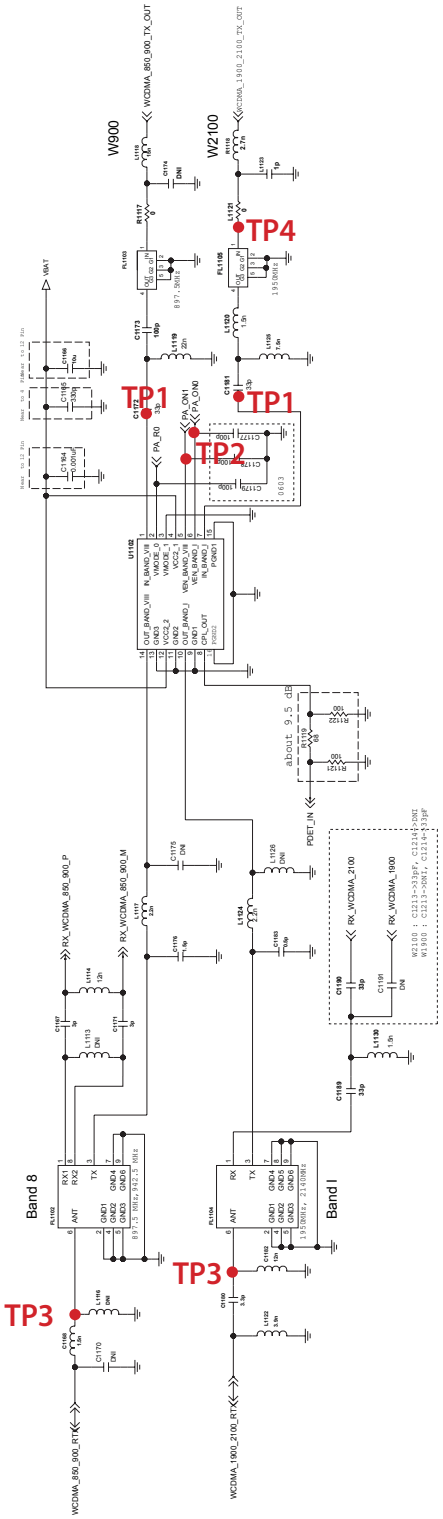
PAM IN/OUT Signal

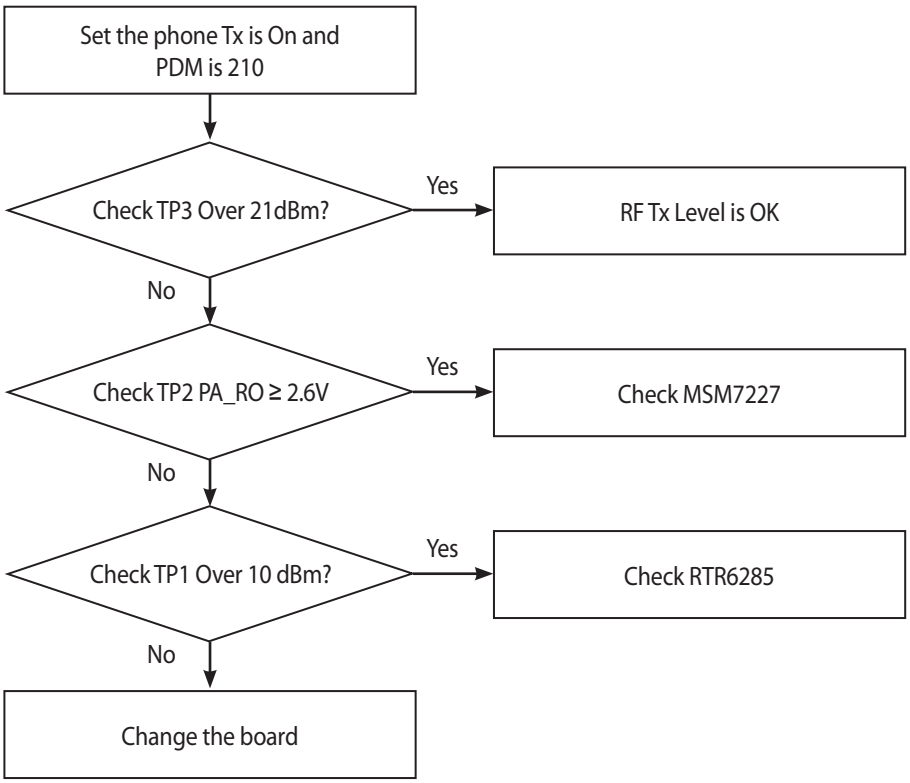
When PAM is under the operation of high power mode (WCDMA_PA_R0(C1179):Low),

PAM OUT power must be over 21 dBm

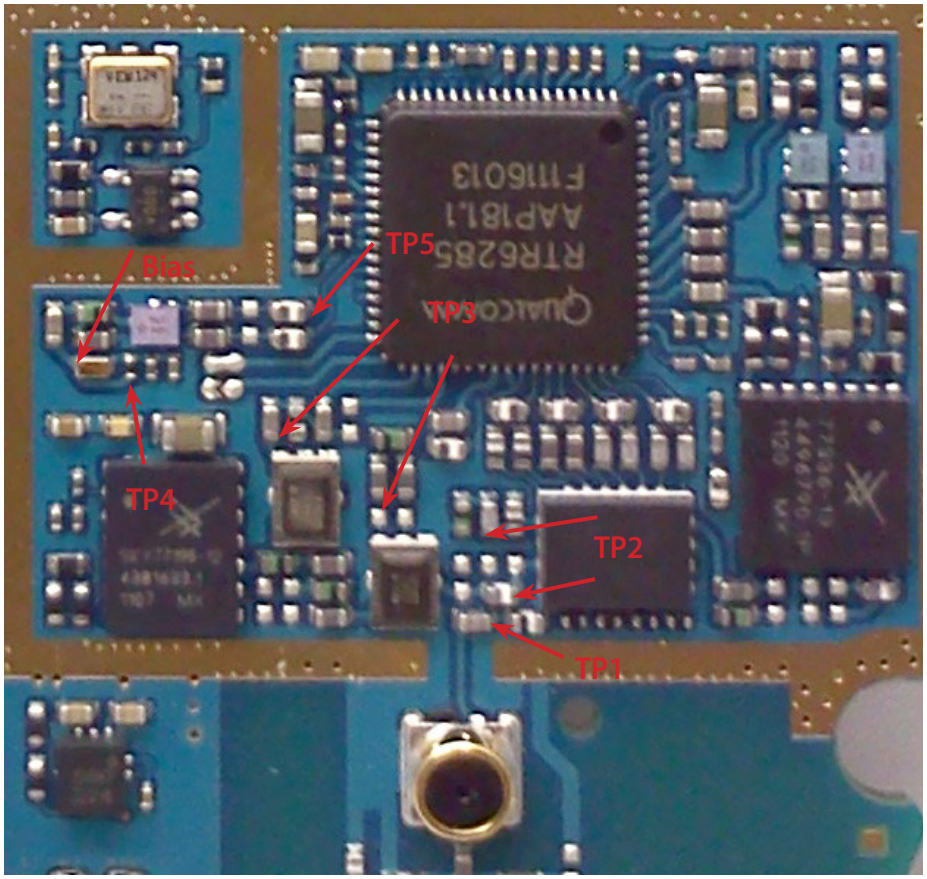
PAM IN power must be under 10 dBm



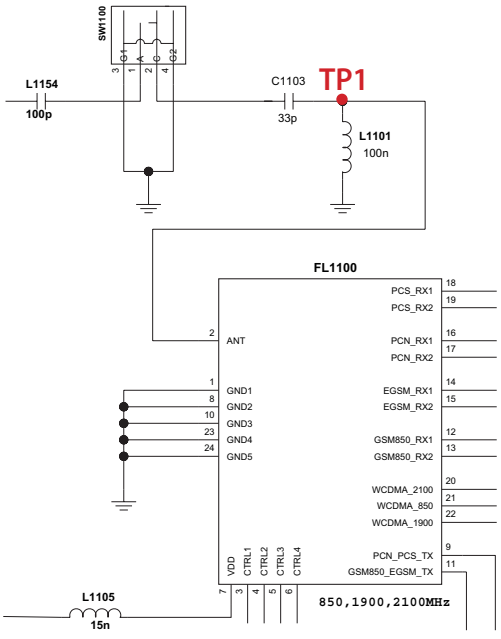


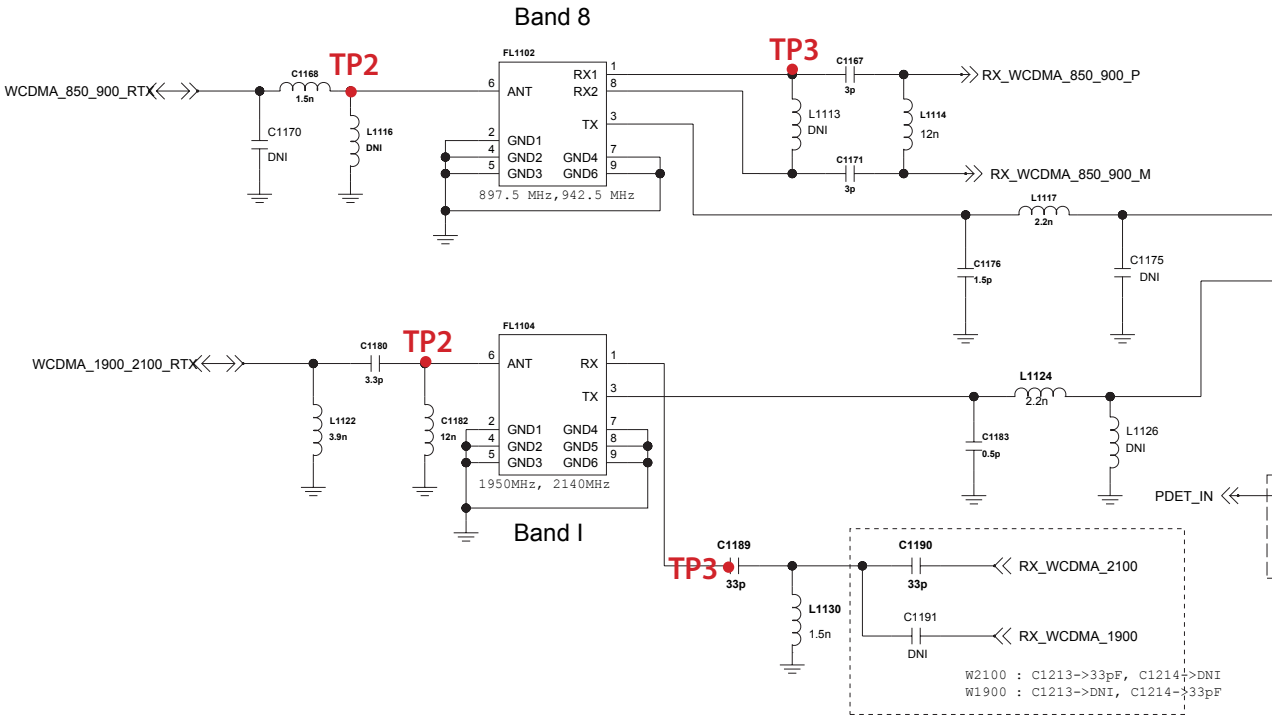


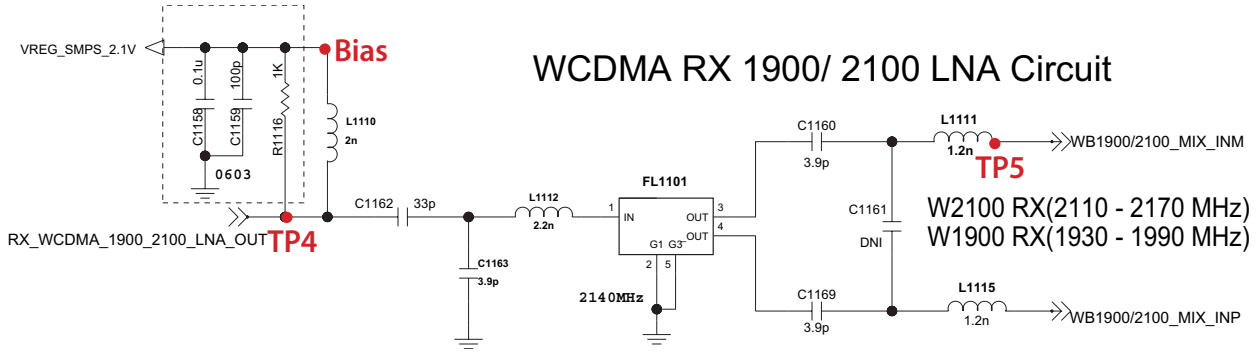
4.5.5. Checking RF Rx Level

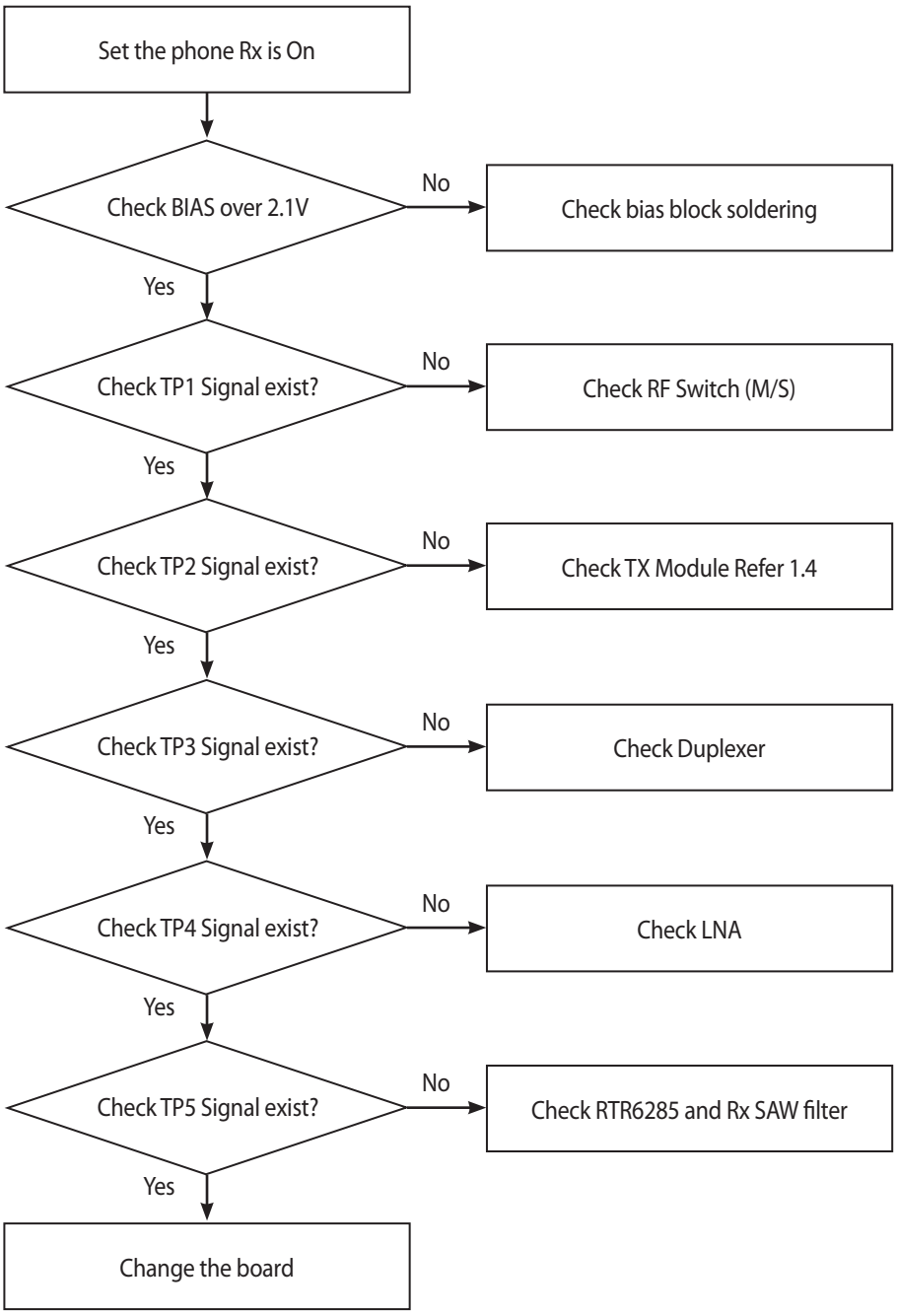


Test Point (RF Rx Level)

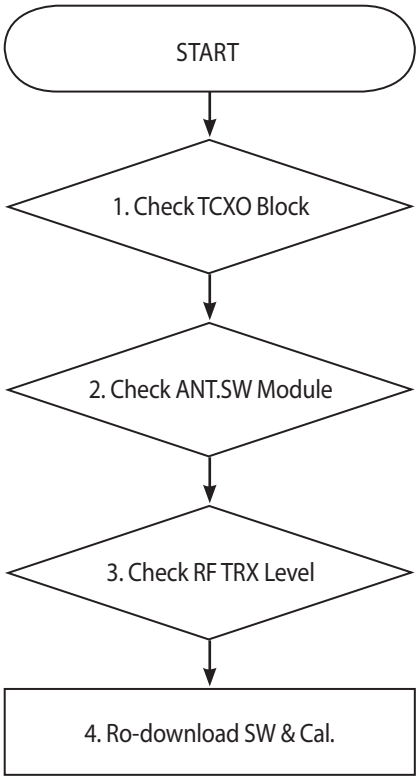


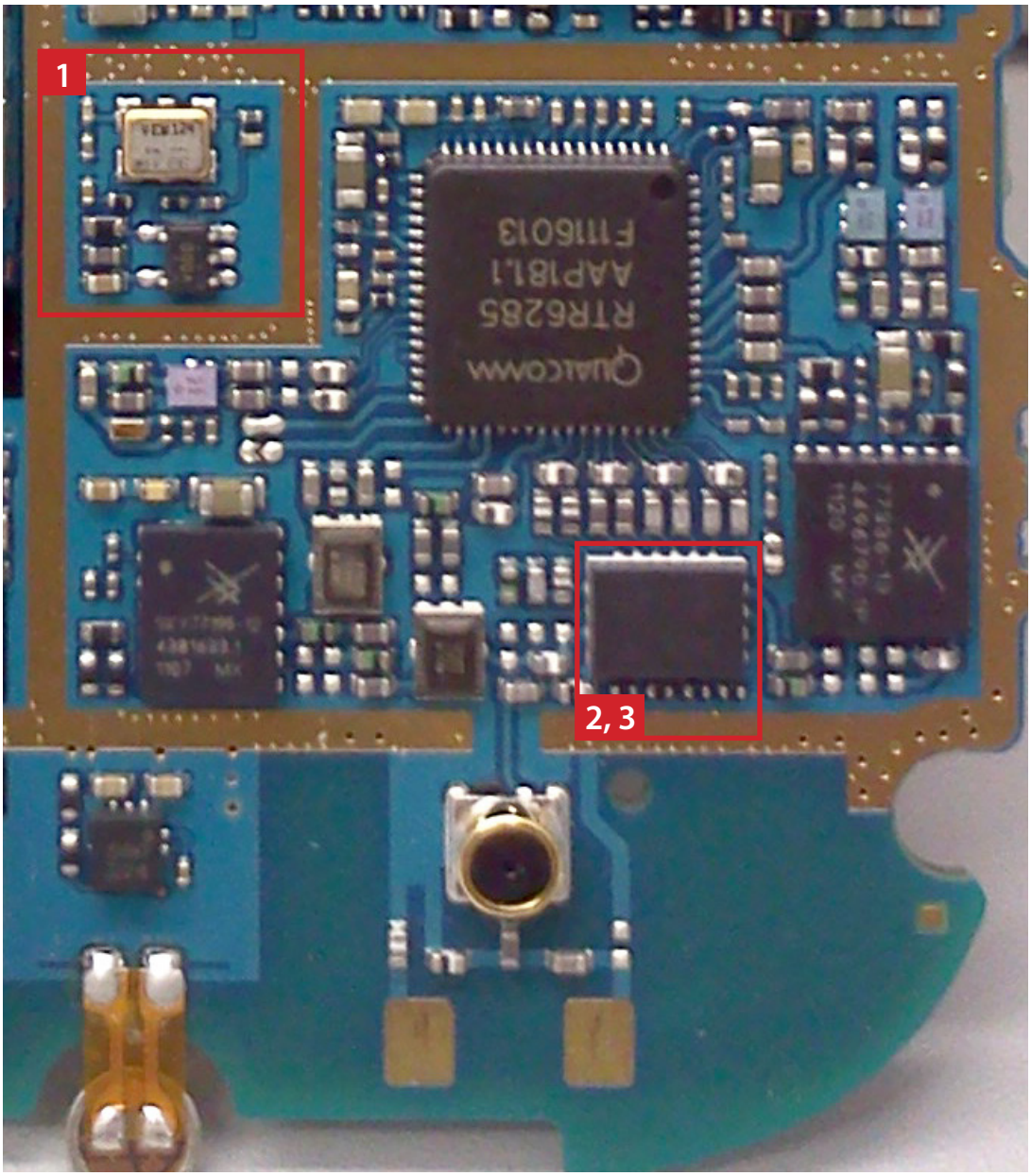






4.6 Checking GSM Block





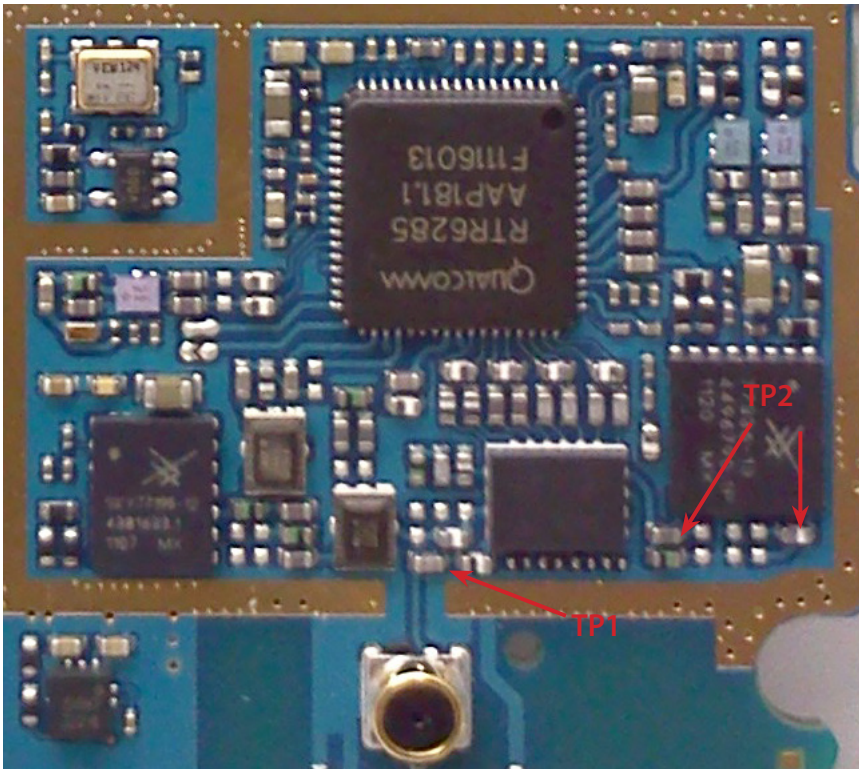
4.6.1 Checking TCXO Block

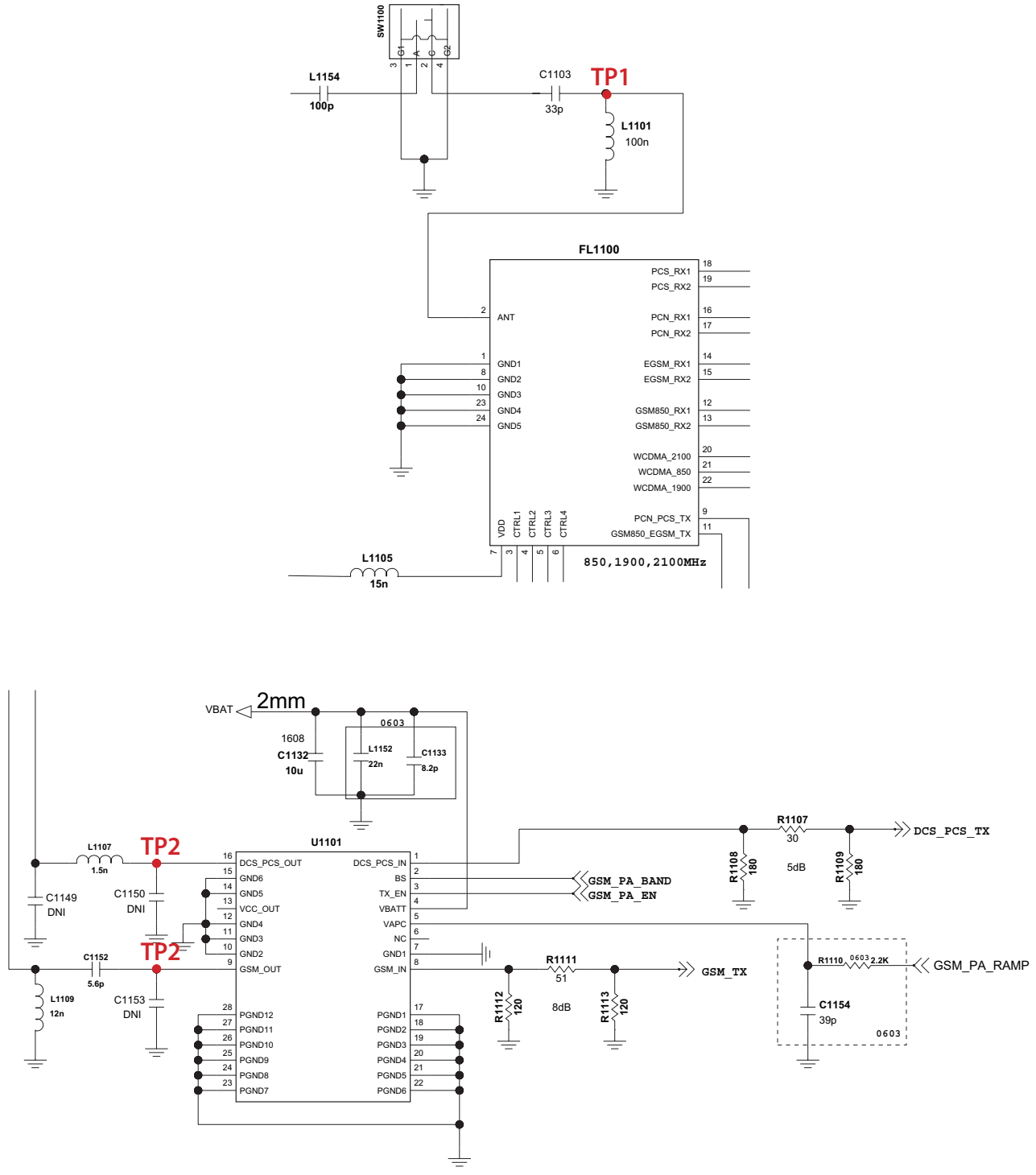
Refer to 1.3

4.6.2 Checking FEM Block

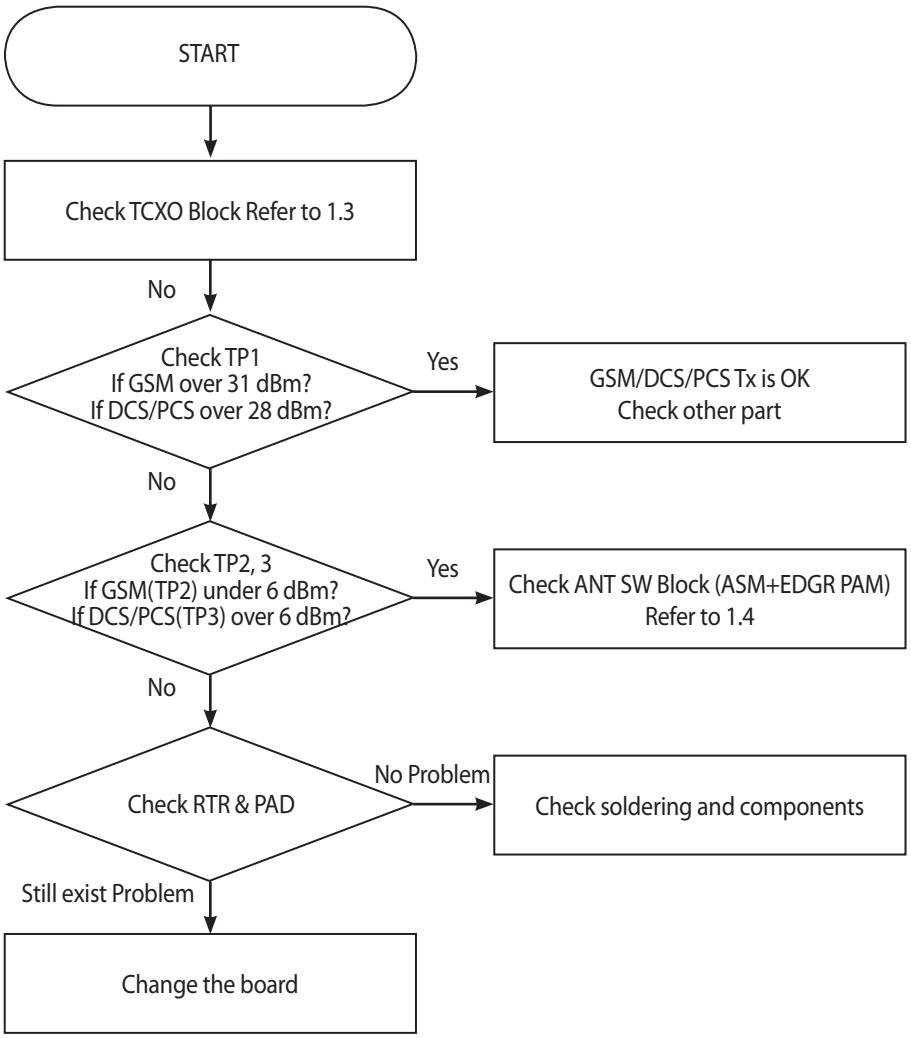
Refer to 1.4

4.6.3 Checking RF TX level

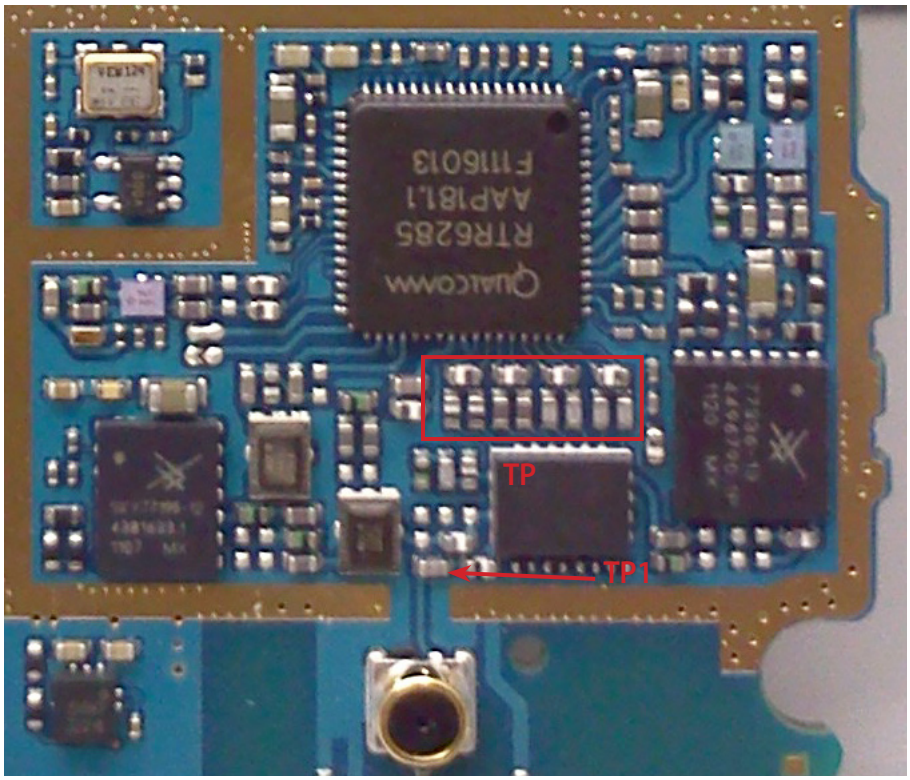


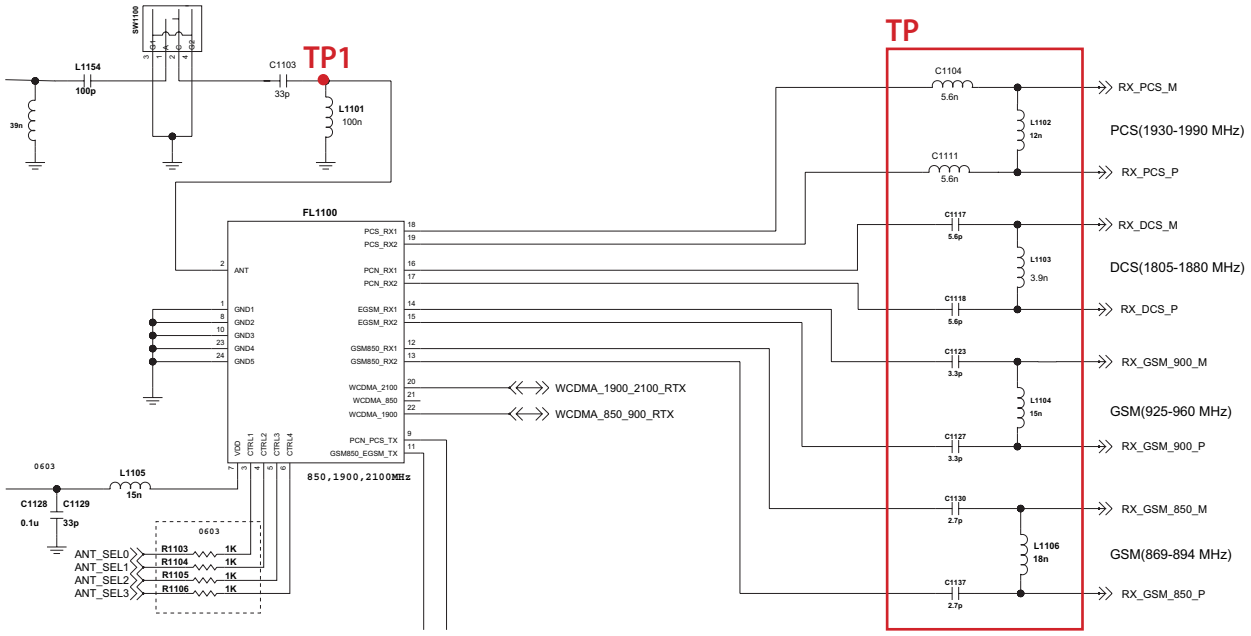


Schematic of GSM/DCS/PCS Tx Block

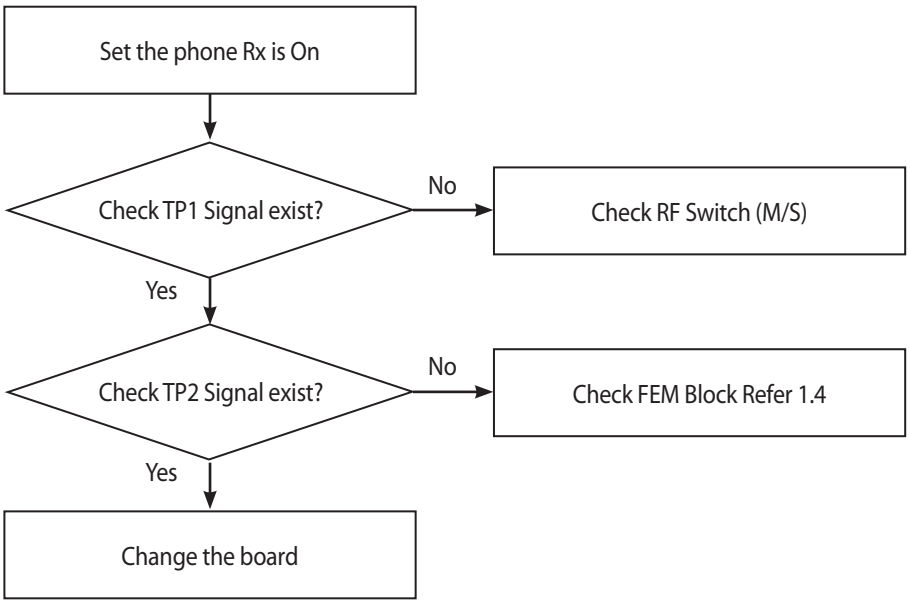


4.6.4 Checking RF Rx Block

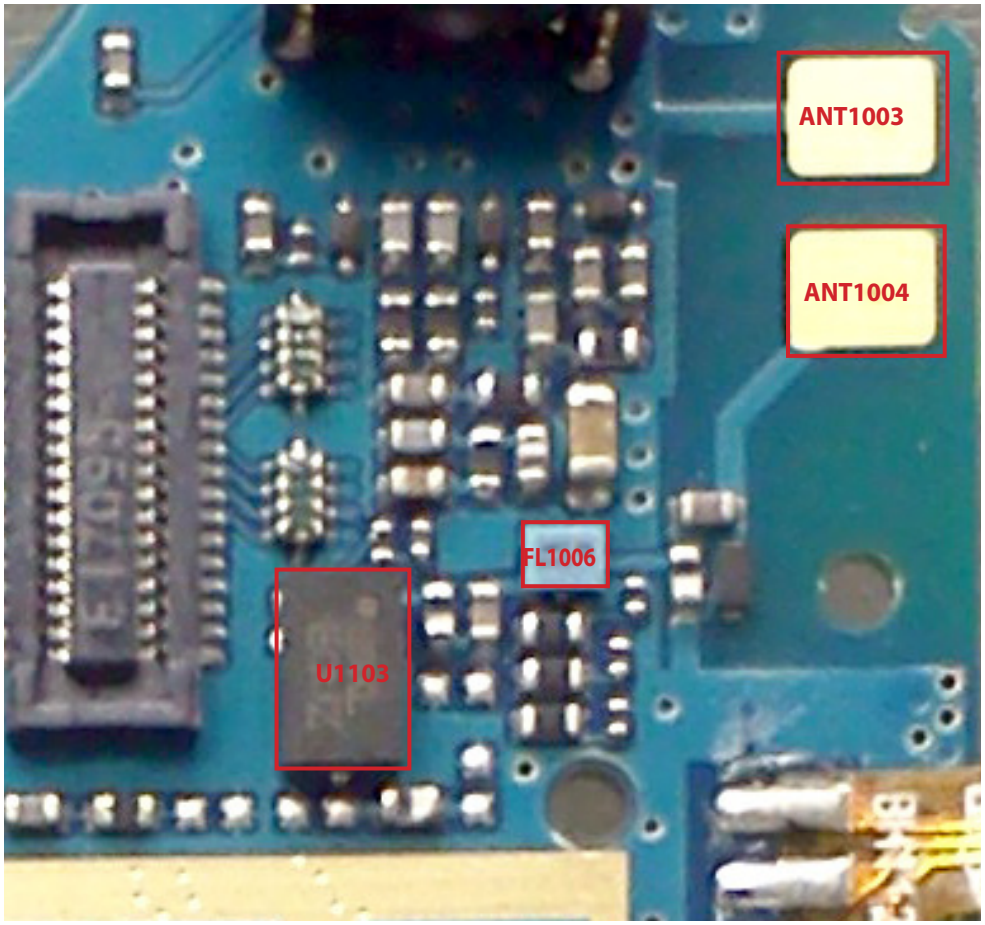




Schematic of GSM/DCS/PCS Rx Block

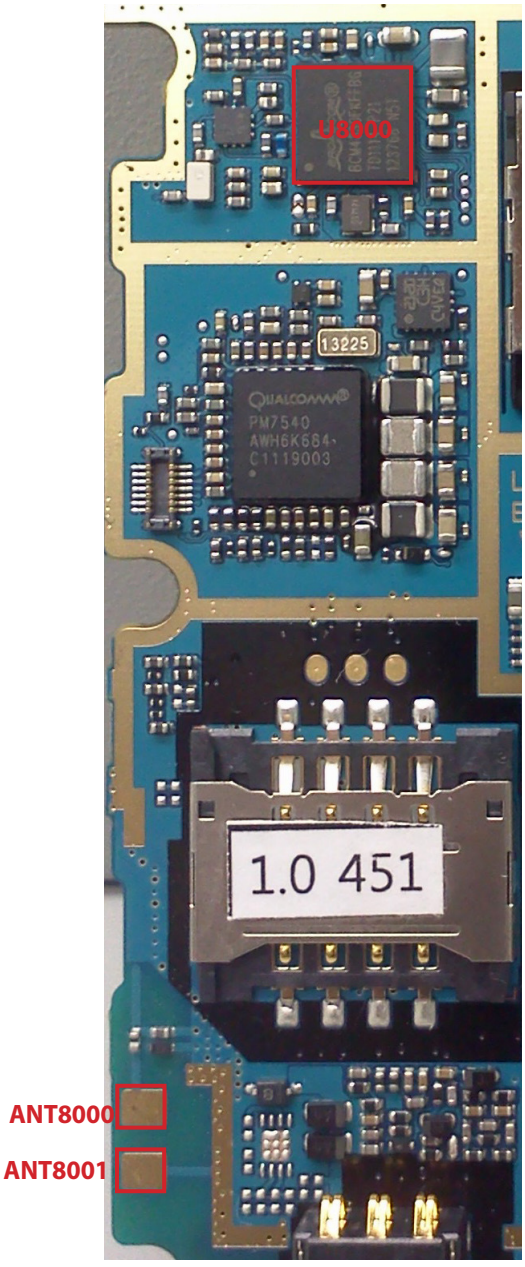


4.7 GPS/WIFI/BT RF Component



RF Component(GPS)

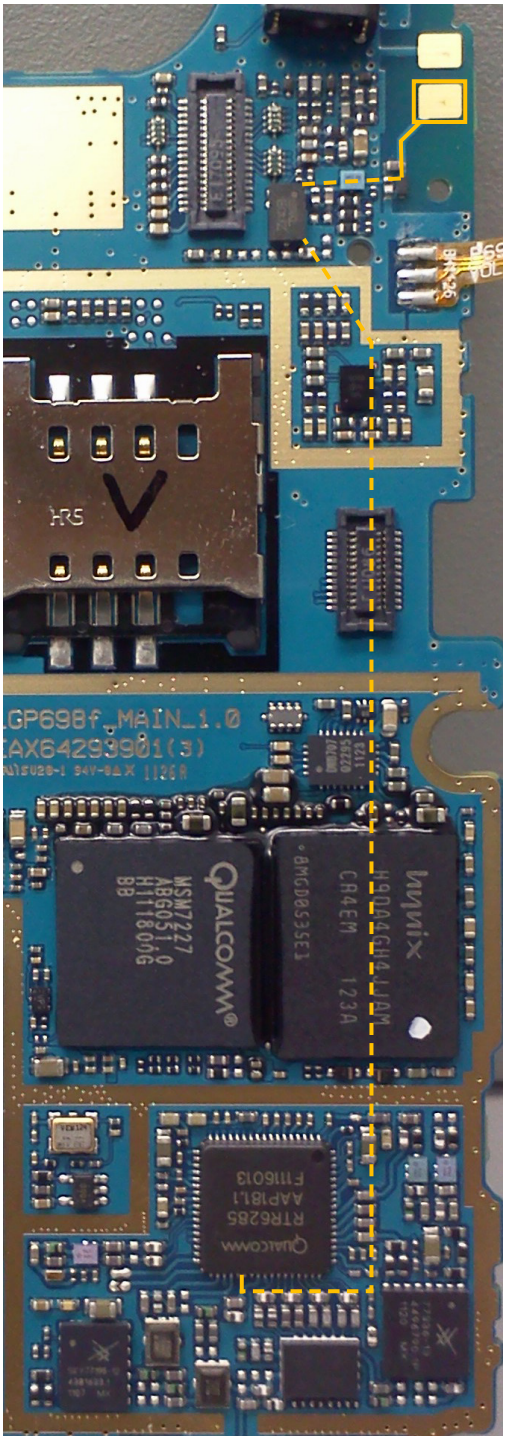
Reference	Description
ANT1103	GND PAD
ANT1104	ANTENNA PAD connected to Carrier type antenna
FL1106	GPS SAW FILTER
U1103	GPS SAW FILTER



RF component (WiFi / BT)

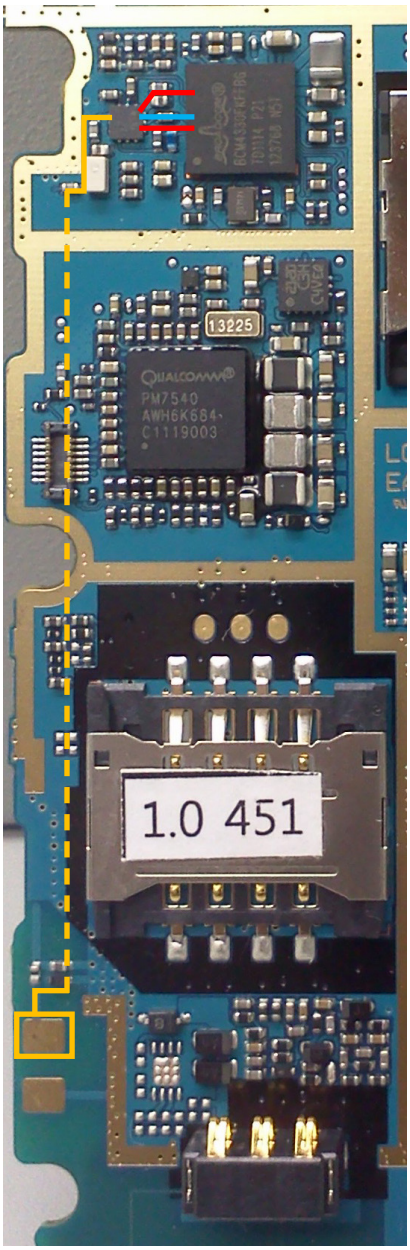
Reference	Description
ANT8000	ANTENNA PAD connected to Carrier type antenna
ANT8001	GND PAD
U8000	WiFi / BT /FM module

4.8 GPS/WIFI/BT SIGNAL PATH



GPS Signal PATH (main board bottom)

GPS Rx PATH



WiFi / BT Signal PATH

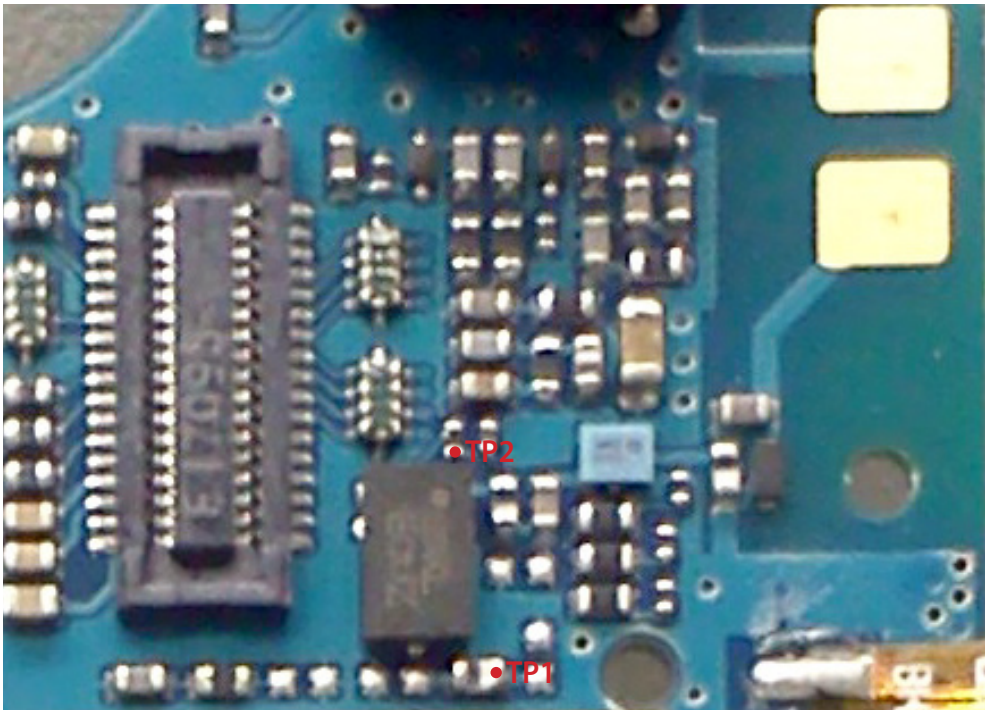
WIFI BT common path

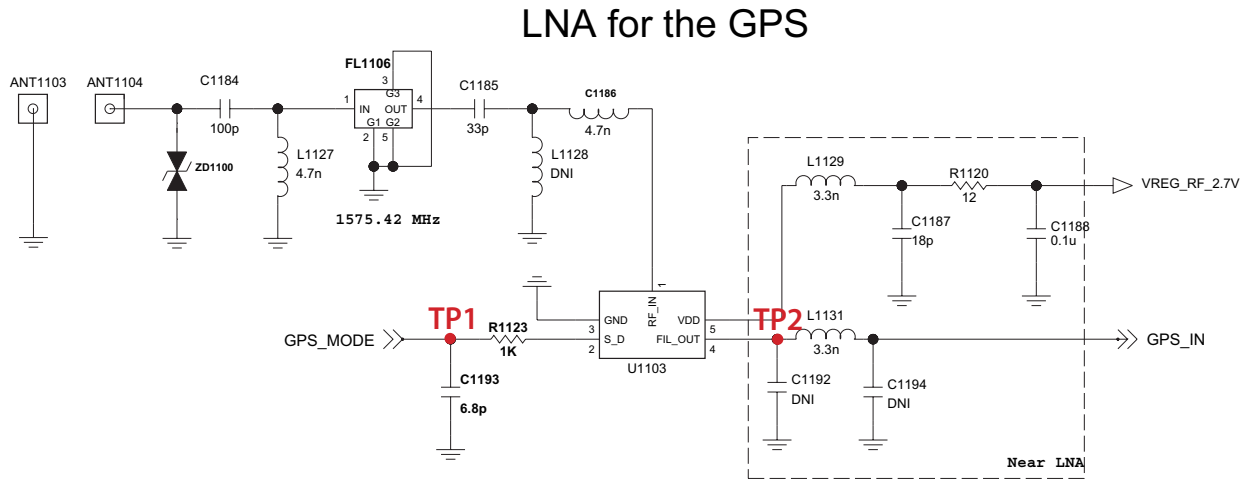
BT Path

WIFI TRx Path

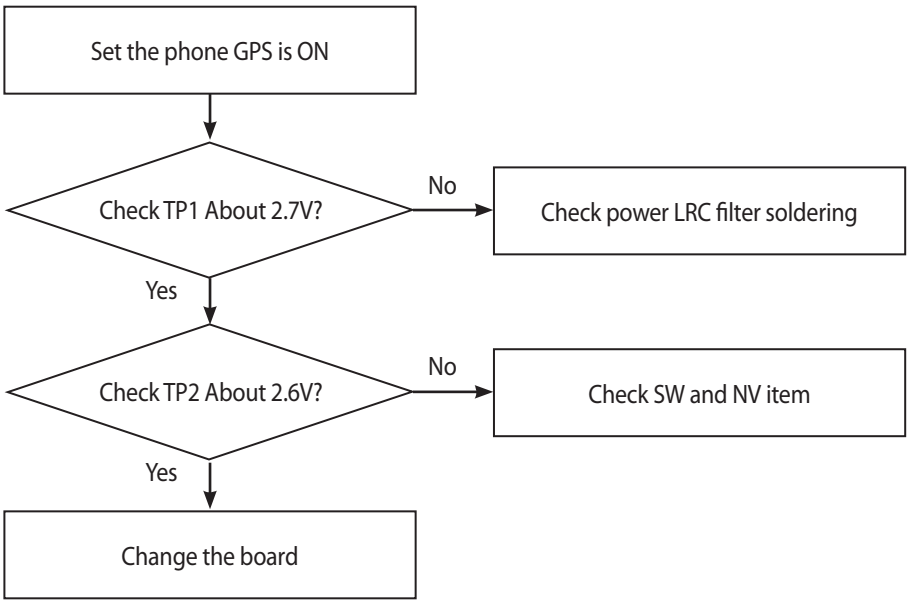
4.9 GPS/WIFI/BT Trouble shooting

4.9.1 A-GPS Block

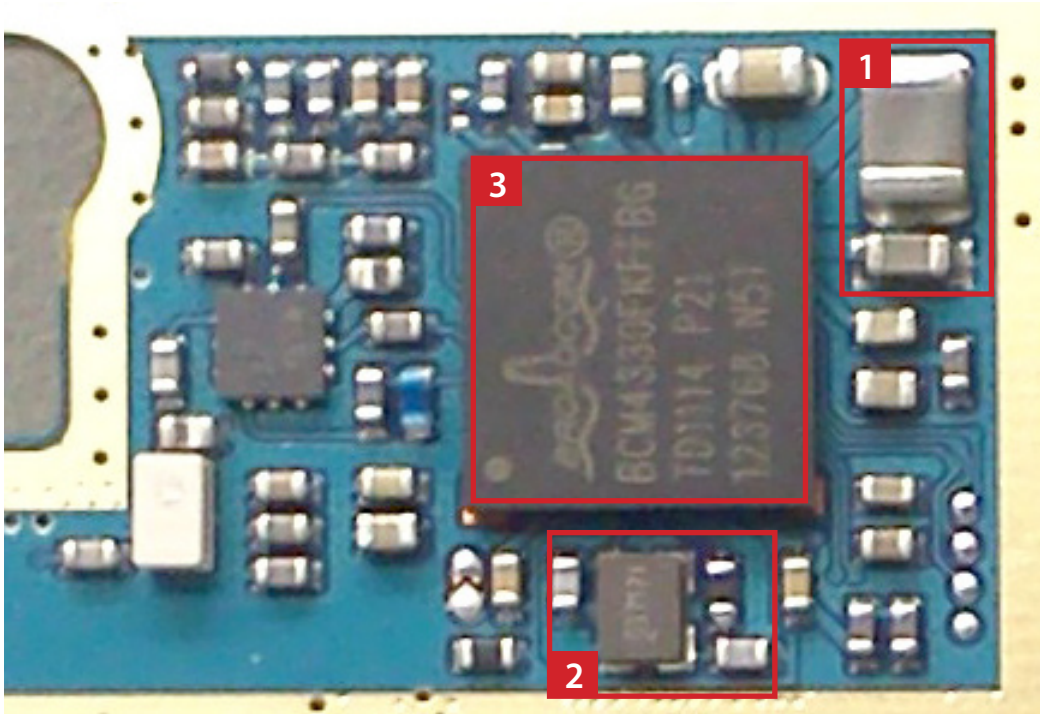


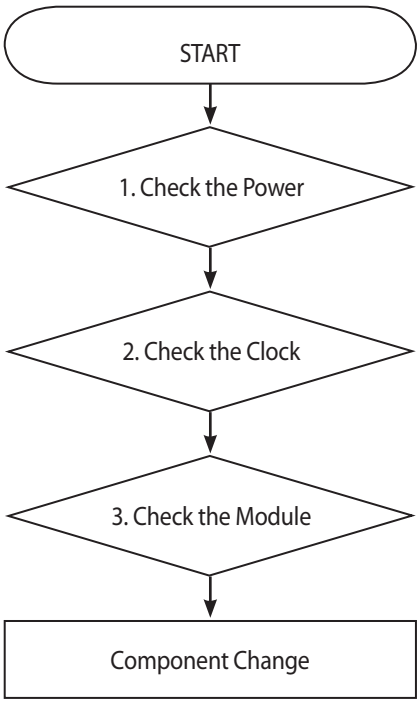


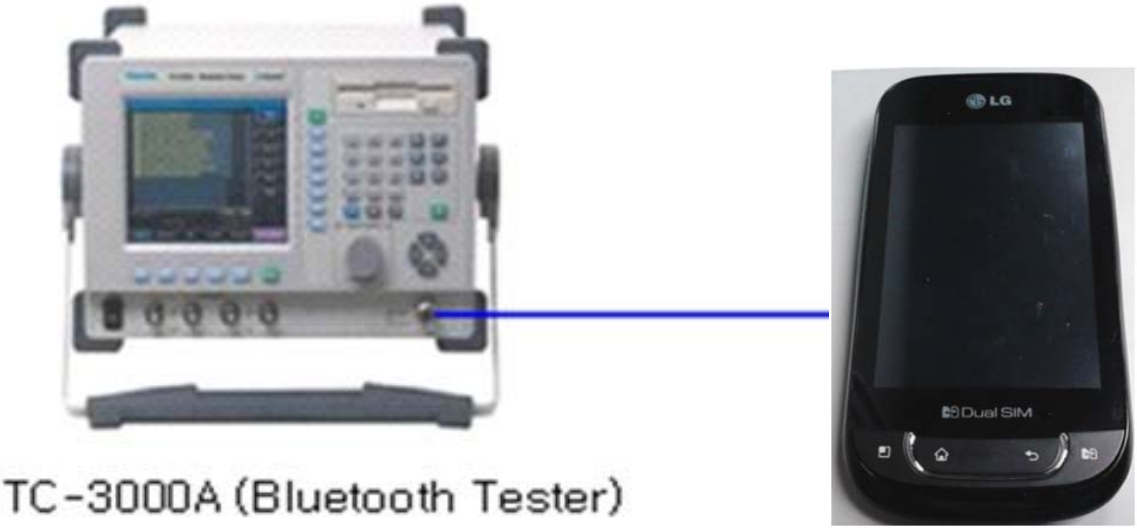
Schematic of the A-GPS block



4.9.2 WLAN/BT/FM Block







- Bluetooth RF Test procedure

1. Set phone to Bluetooth test-mode.

- Blue tooth ON: Enter Test Mode(3845#*698#) → Module test set → BT DUT → BT DUT ON

2. Insert a phone in a TEMCELL (in case of radiation test)

3. Set 'discover' after push menu button of the tester and select the link analyzer.

4. After 'set test mode', confirm the connection state.

5. Measure the power of full channel after hopping mode is selected to 'ON'

6. You can select wanted test cases after getting an optimized power

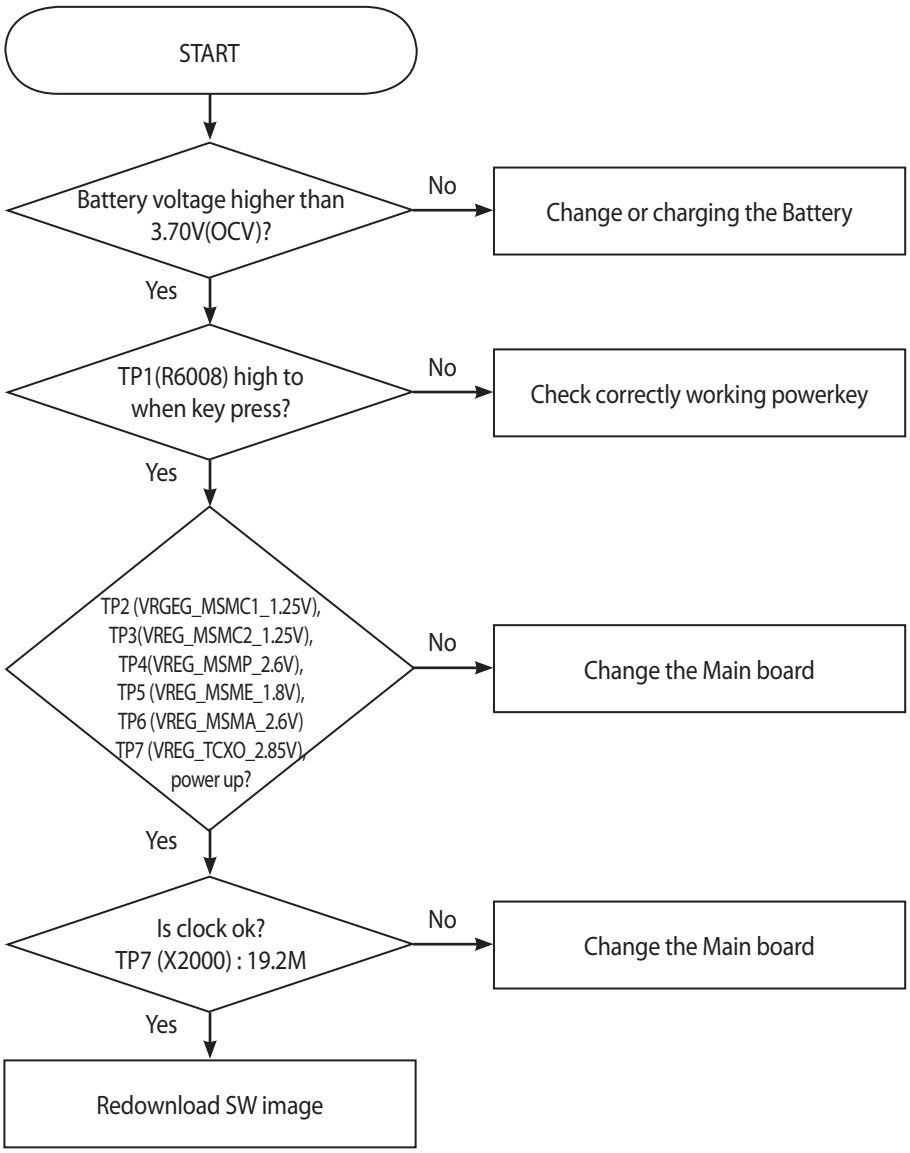
7. Blue tooth On/Off

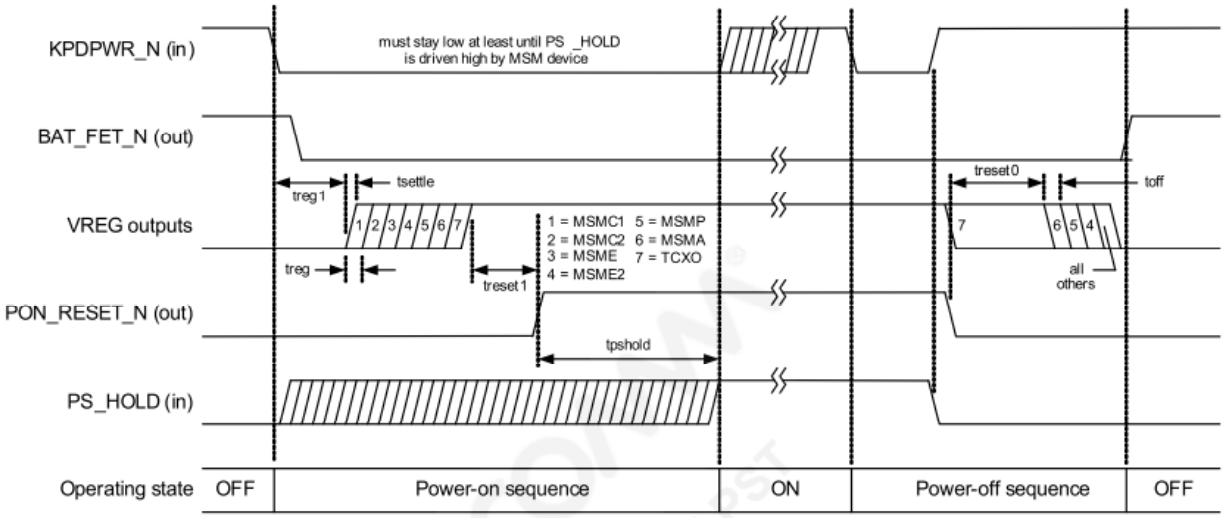
- Menu Key→settings→Wireless controls→Bluetooth→Turn on/Turn off

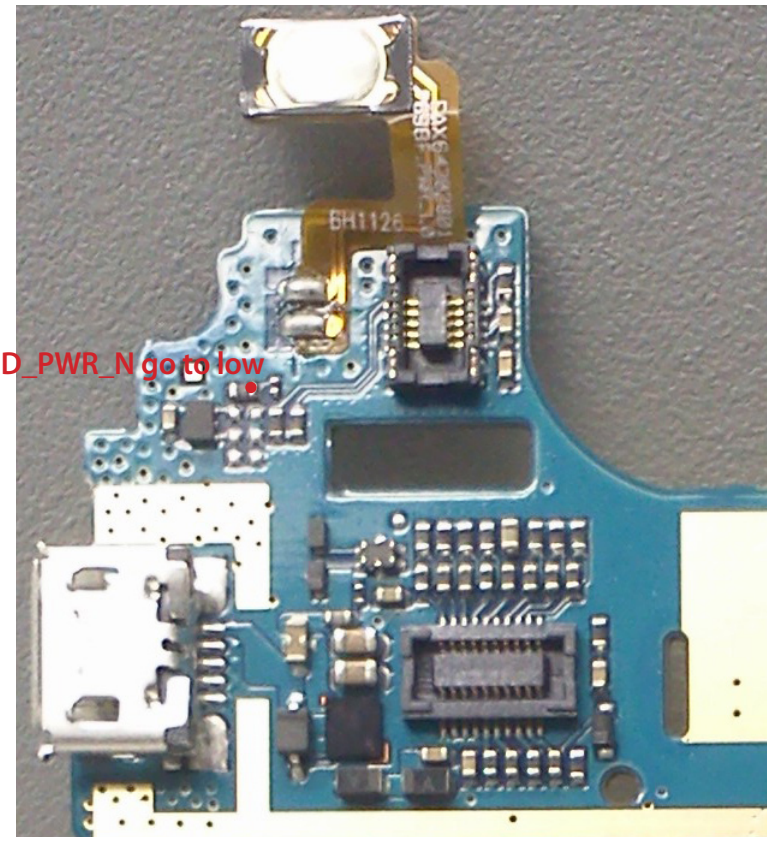
4.10 Power ON Troubleshooting

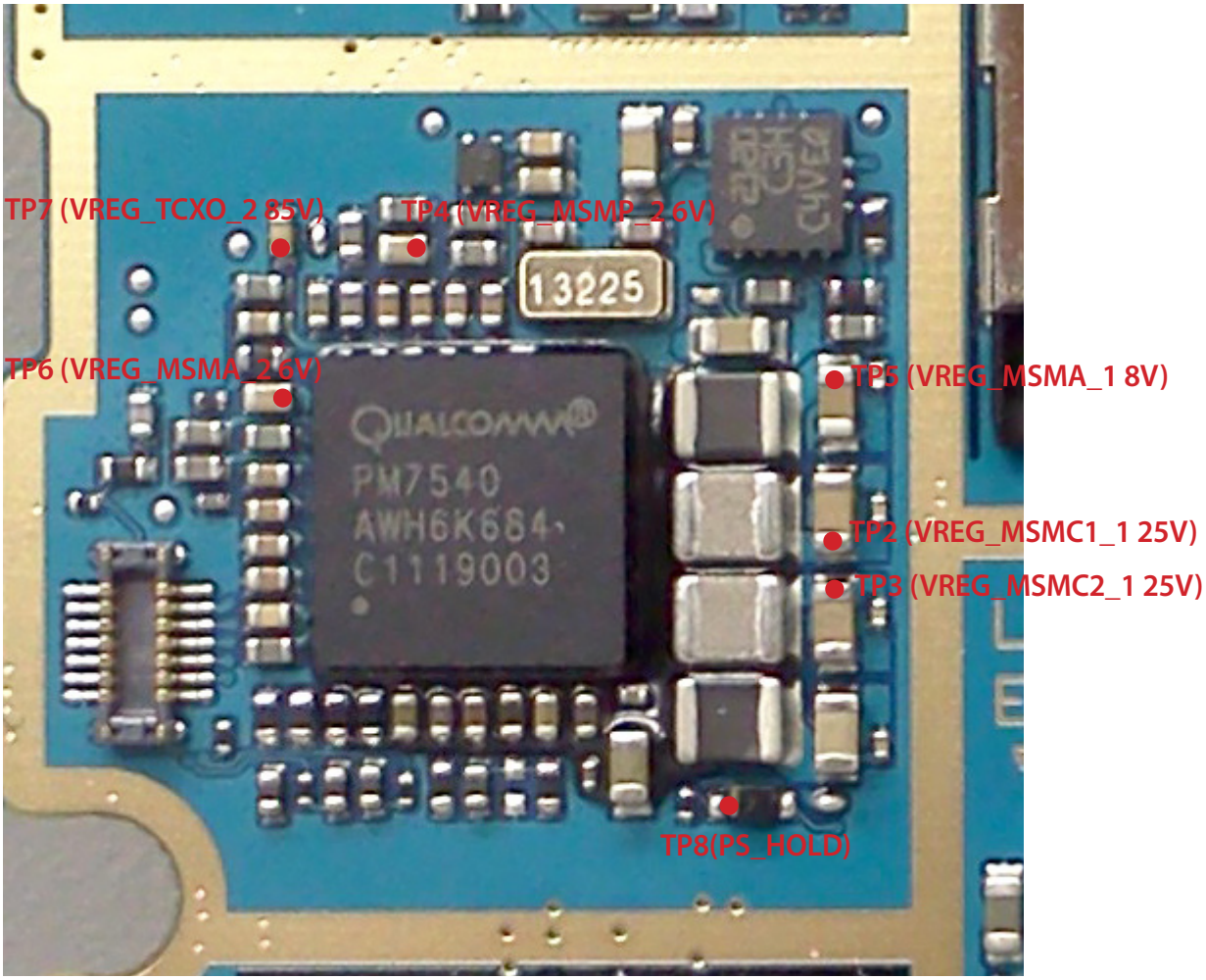
Power On sequence of P698 is :

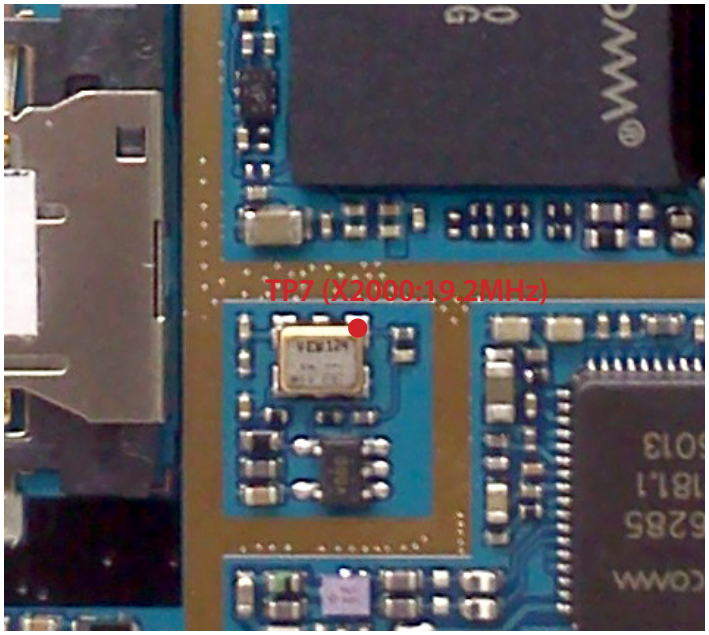
Power key press → KPD_PWR_N go to low → PM7540 Power Up → VREG_MSMC1_1.25V(C4032), VREG_MSMC2_1.25V(C4033), VREG_MSME_1.8V(C4034), VREG_MSMP_2.6V(C4054), VREG_MSMA_2.6V(C4052), VREG_TCXO_2.85V(C4057) power ON → Phone booting and PS_HOLD(D4003) go to High.



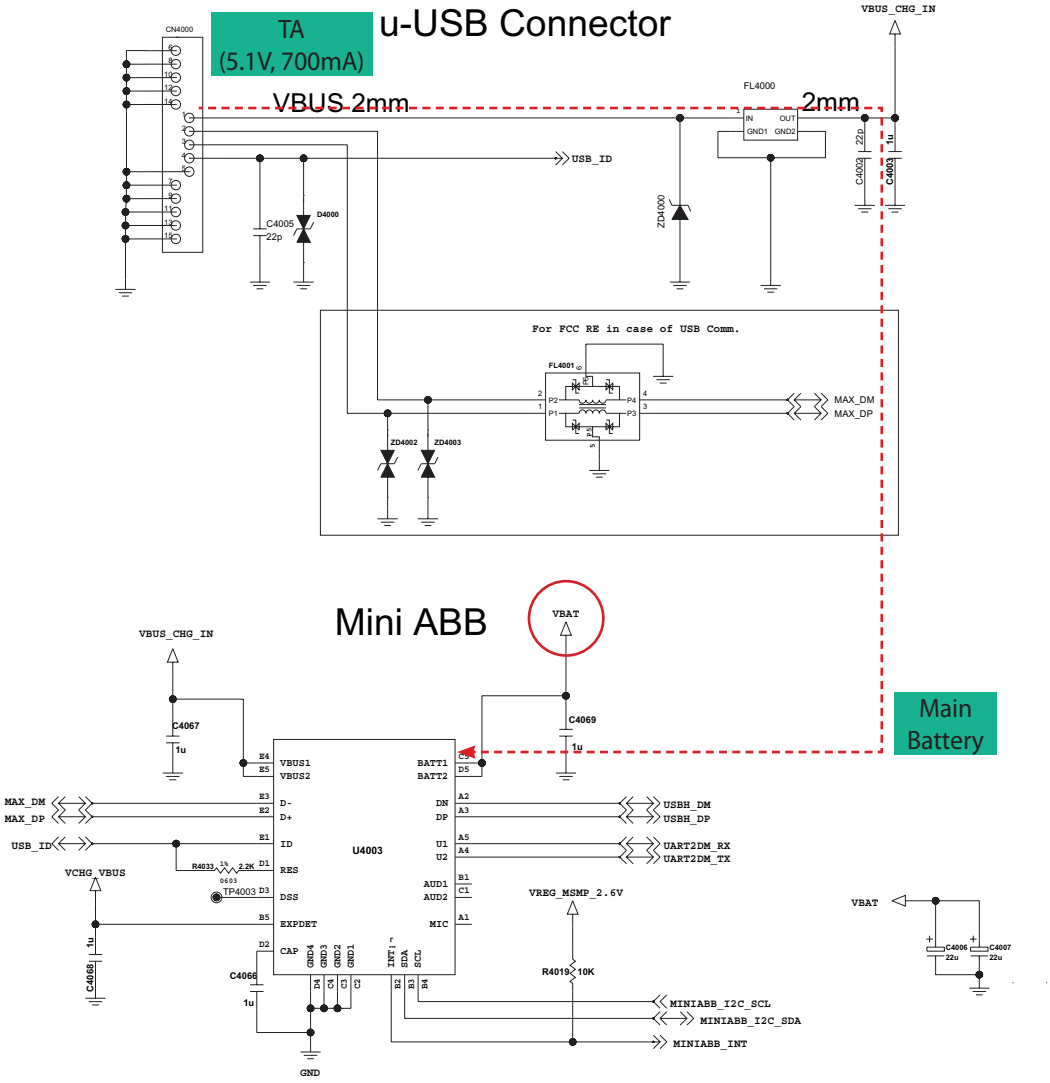








4.11 Charging Trouble shooting



Charging Procedure

- Connect TA or u-USB Cable
- Control the charging current by RT8965 IC
- Charging current flows into the battery

Check Point

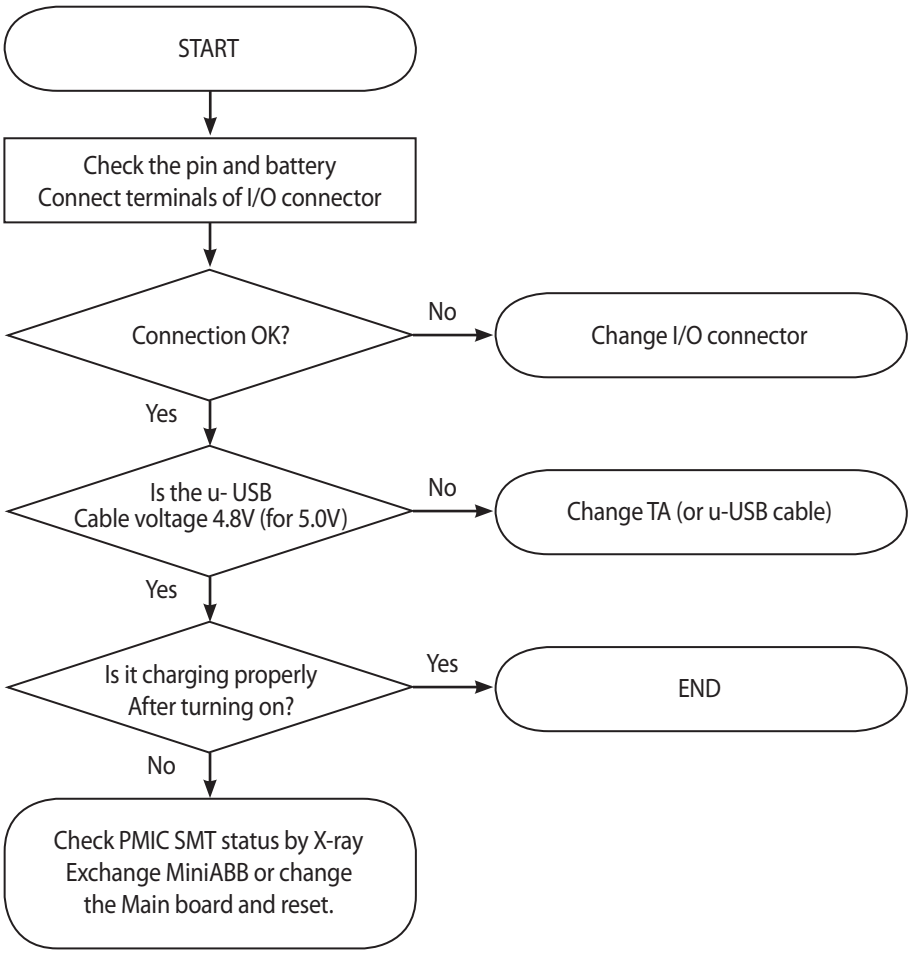
- Connection of TA or USB Cable
-Charging IC (RT8965)
- Battery

Troubleshooting Setup

- Connect TA and battery to the phone

Troubleshooting Procedure

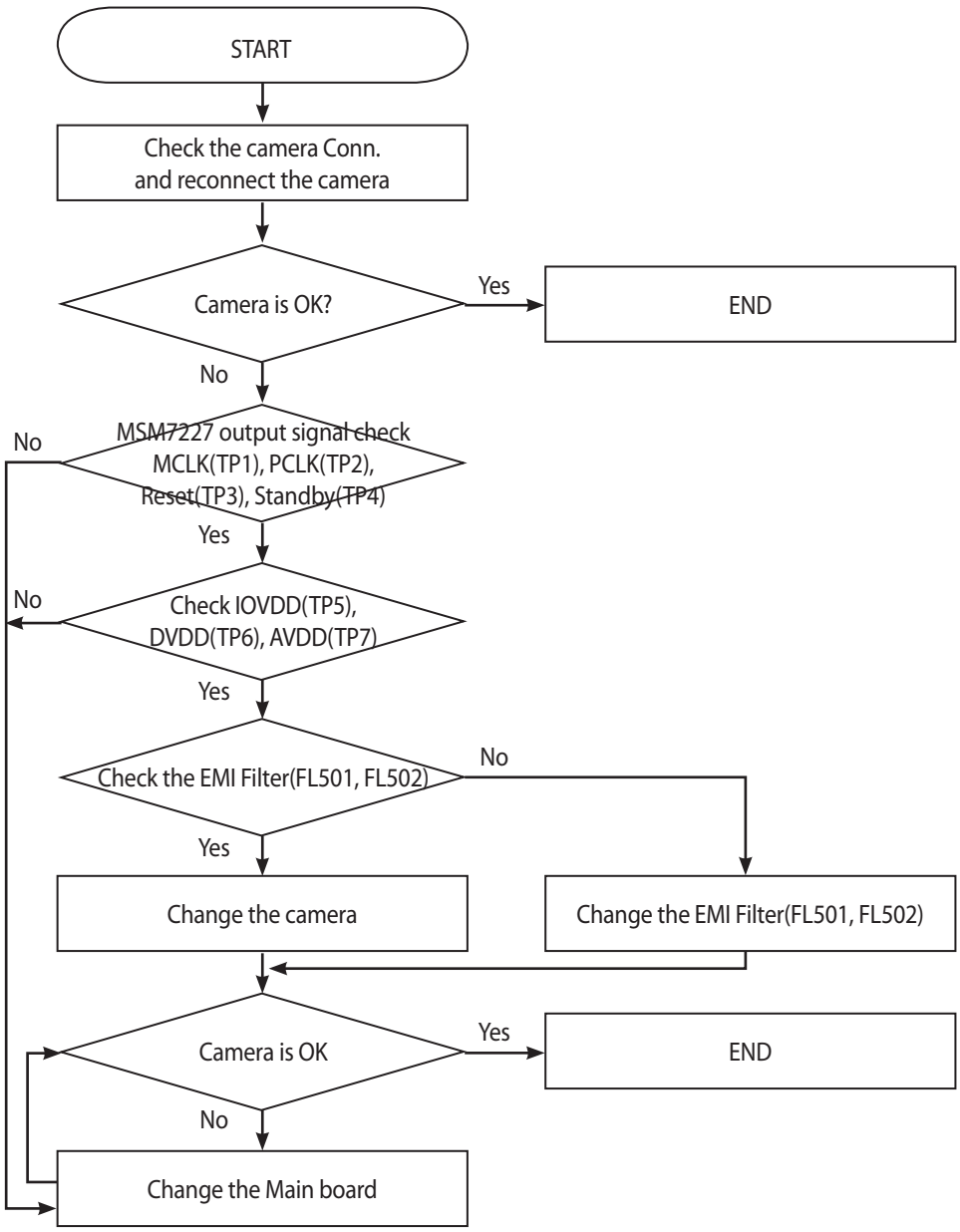
- Check the charger (TA or USB Cable) connector
- Check the OVP Circuit
- Check the Charging IC
- Check the battery

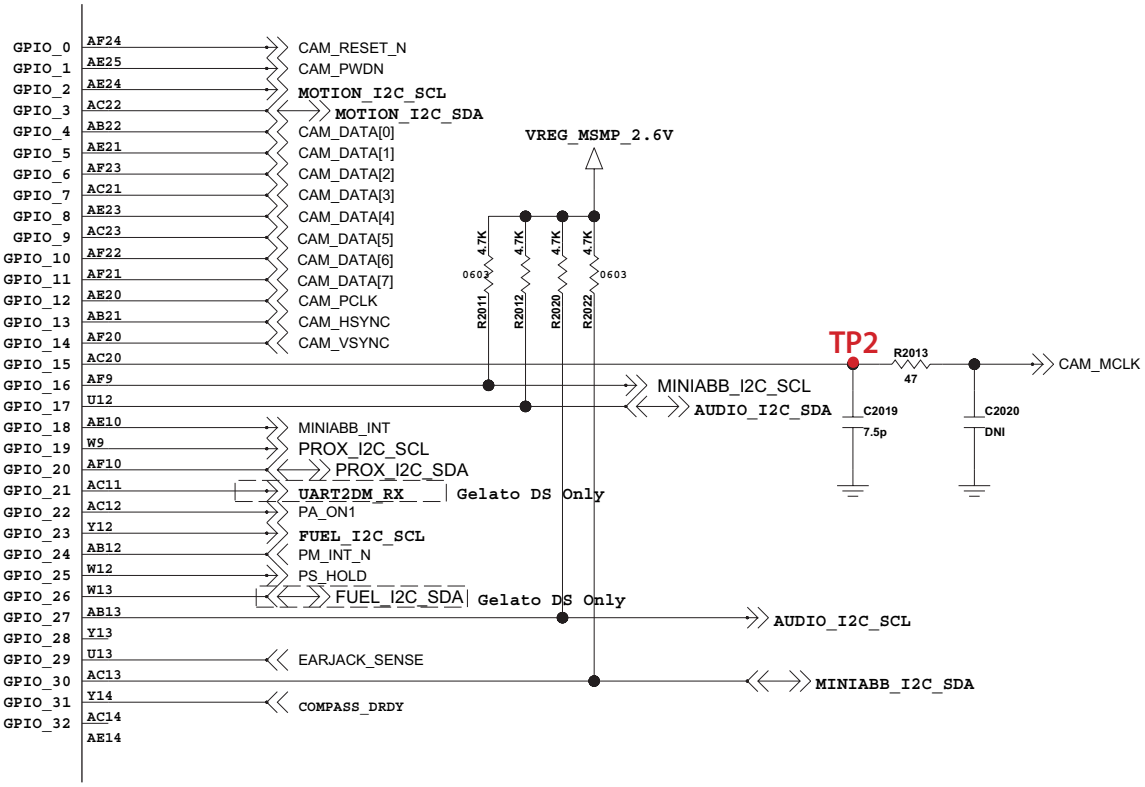


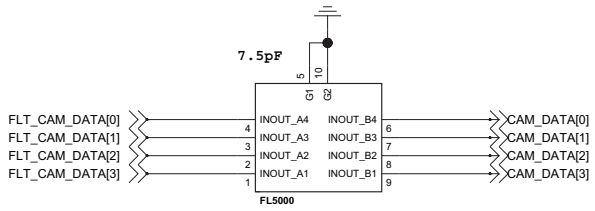
Charger Troubleshooting Flow

4.12 3M AF Camera Trouble Shooting

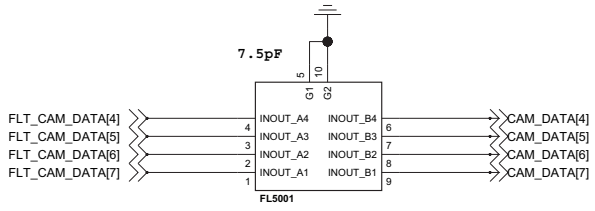
3M camera control signals are generated by Cam sensor and MSM7227T.



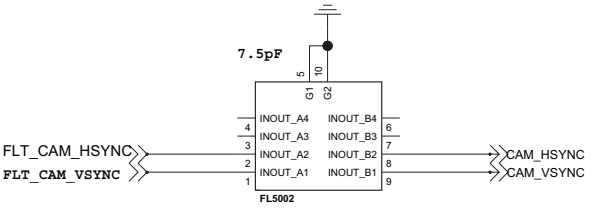




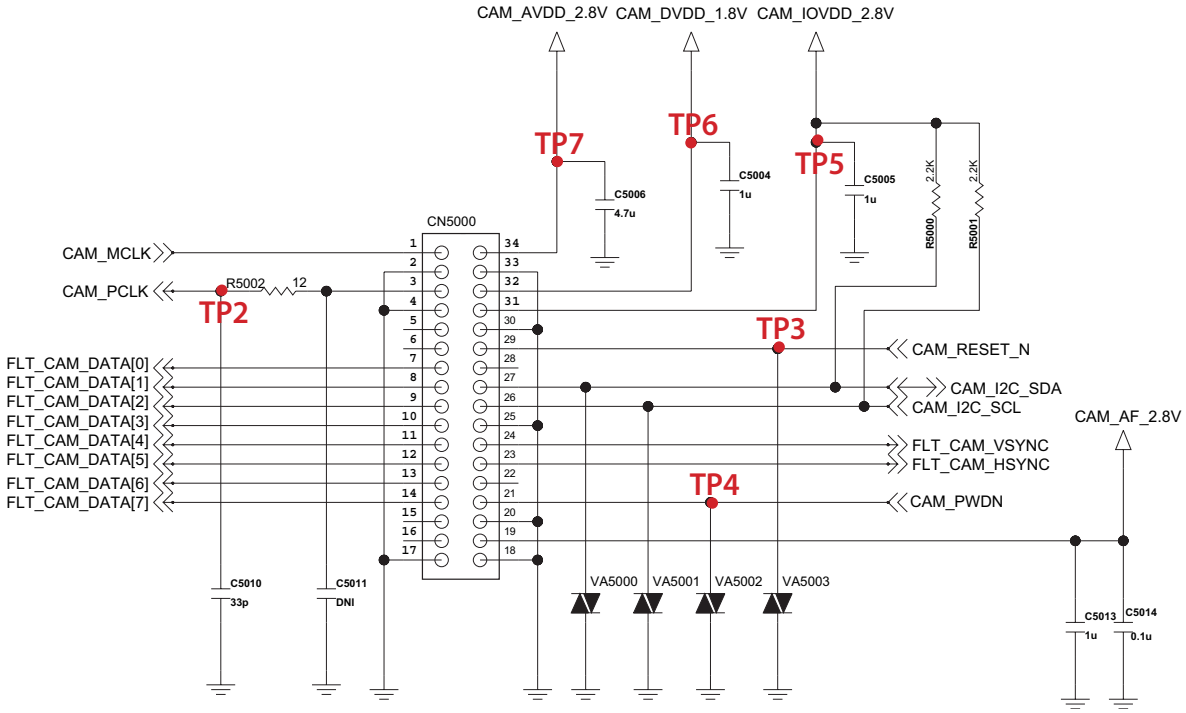
1608

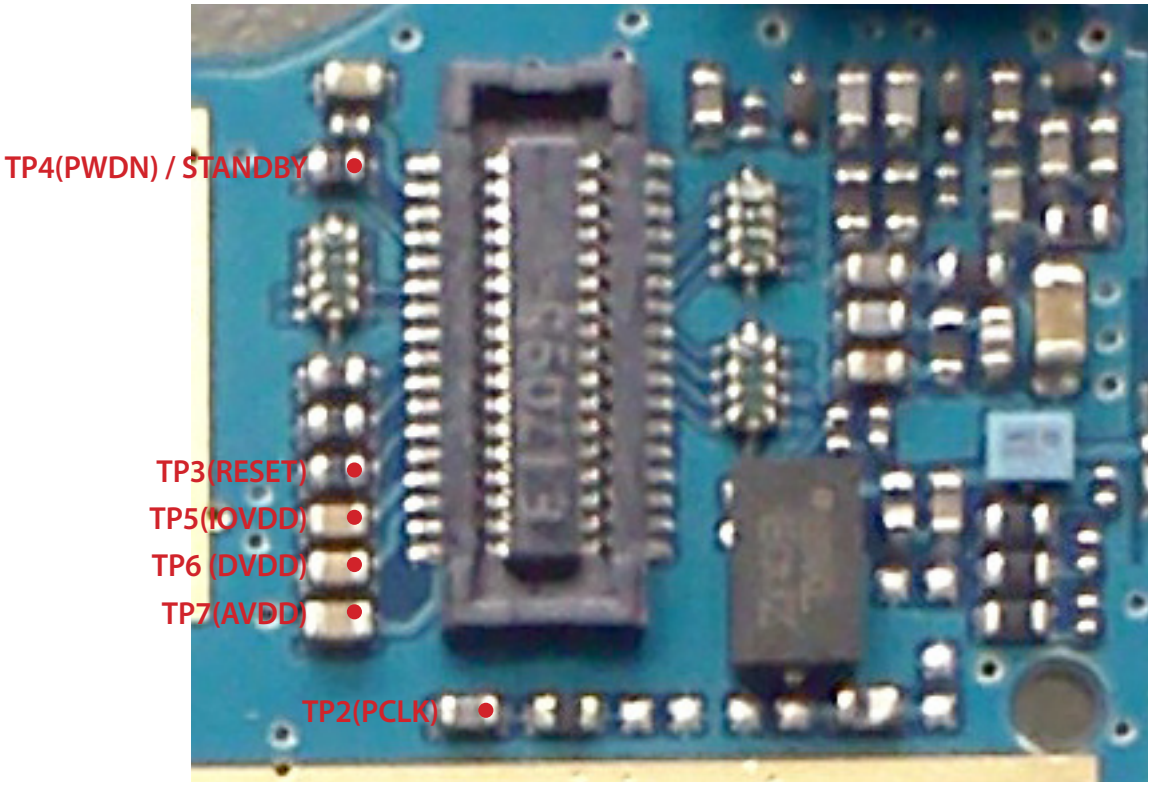


1608



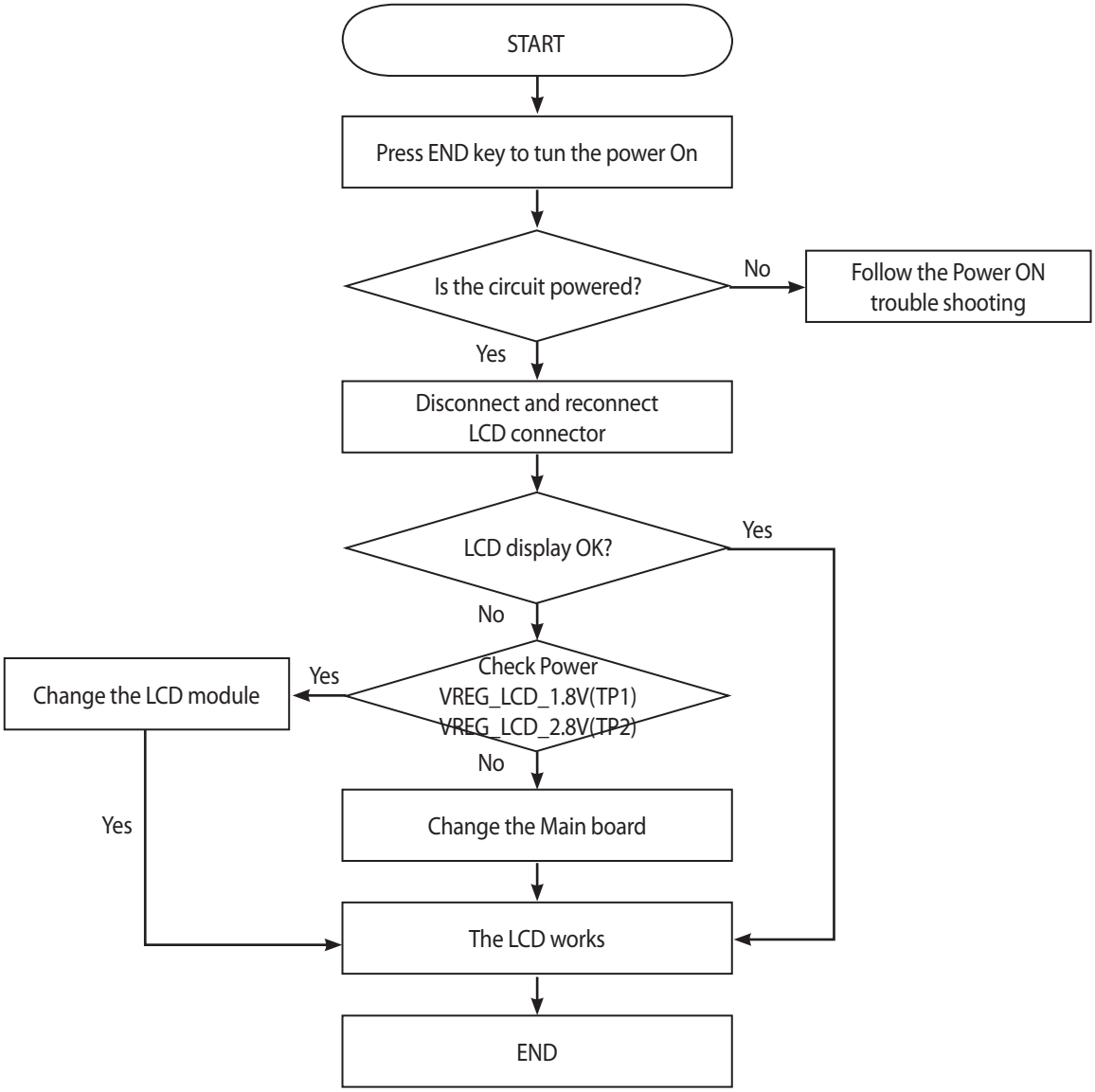
1608



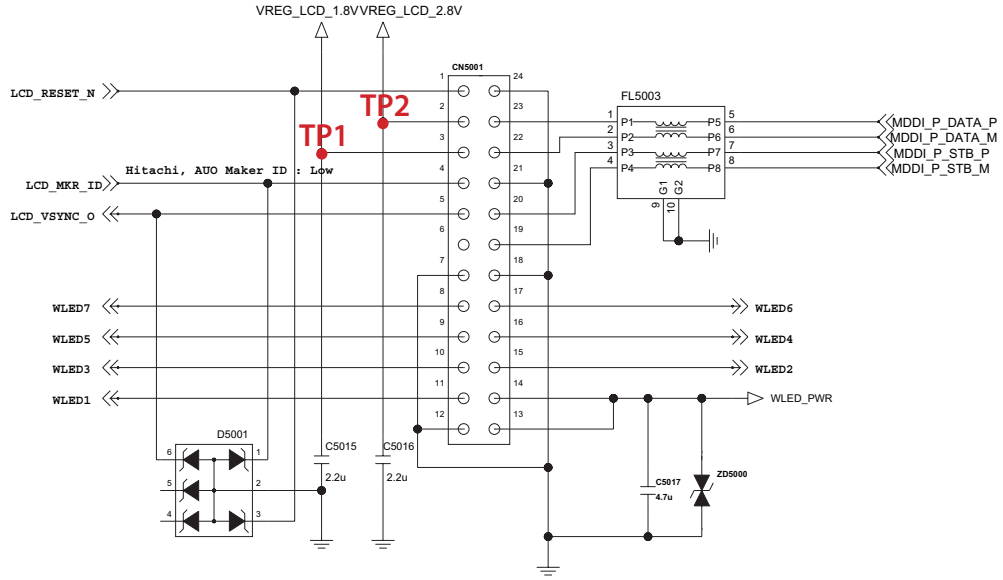


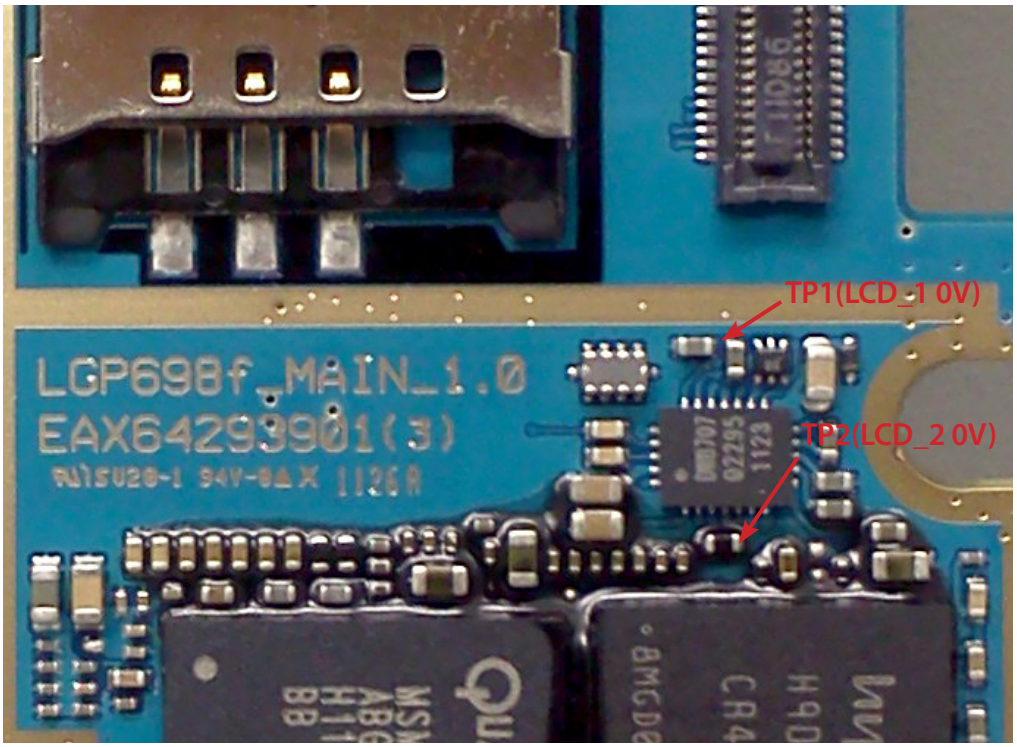
4.13 Main LCD Trouble Shooting

Main LCD control signals are generated by MSM7227T. Those signal's path are : MSM7227T → LCD Module

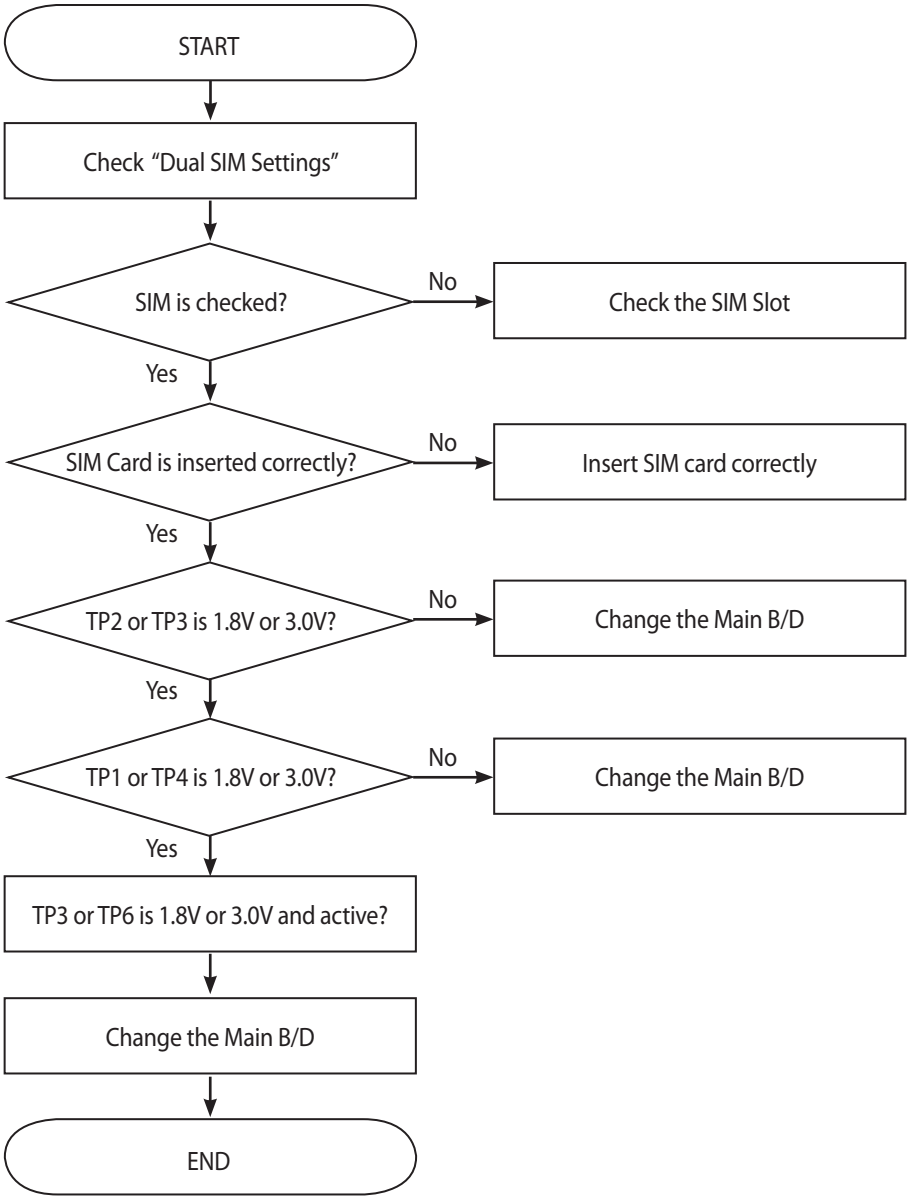


1'st Hitachi_3.2" SVLM0041401
2'nd AUO_3.2" EAJ61772101(H320QN01 V0)



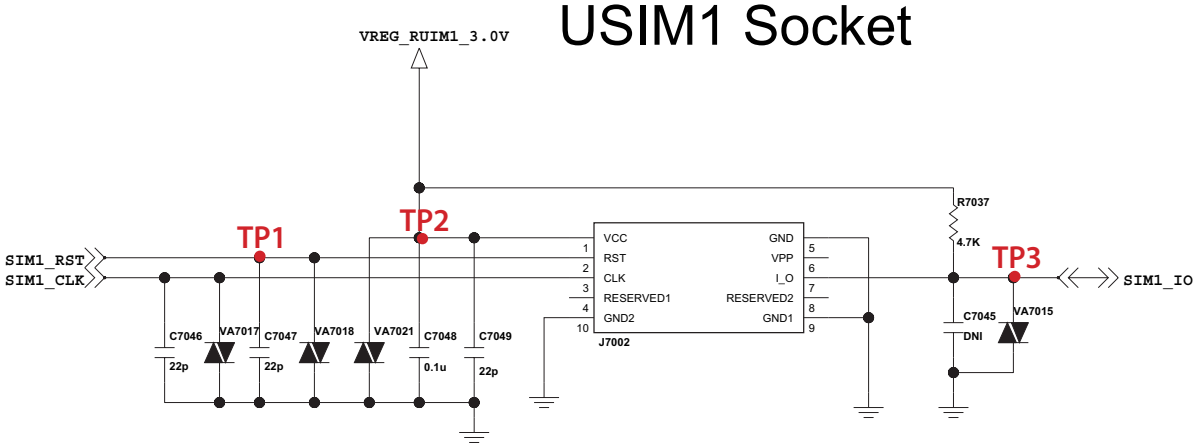


4.14 SIM detect trouble shooting

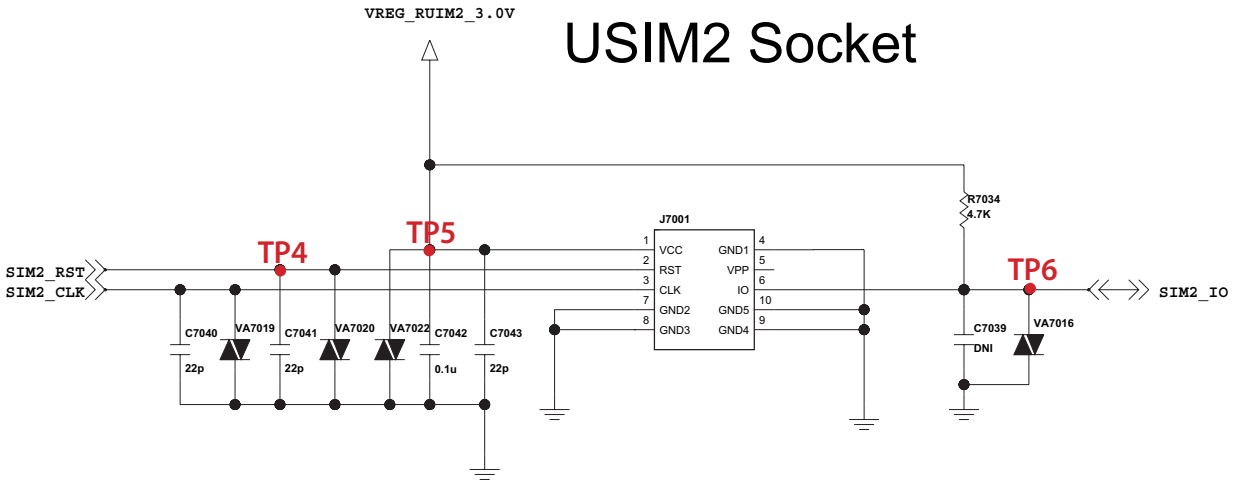


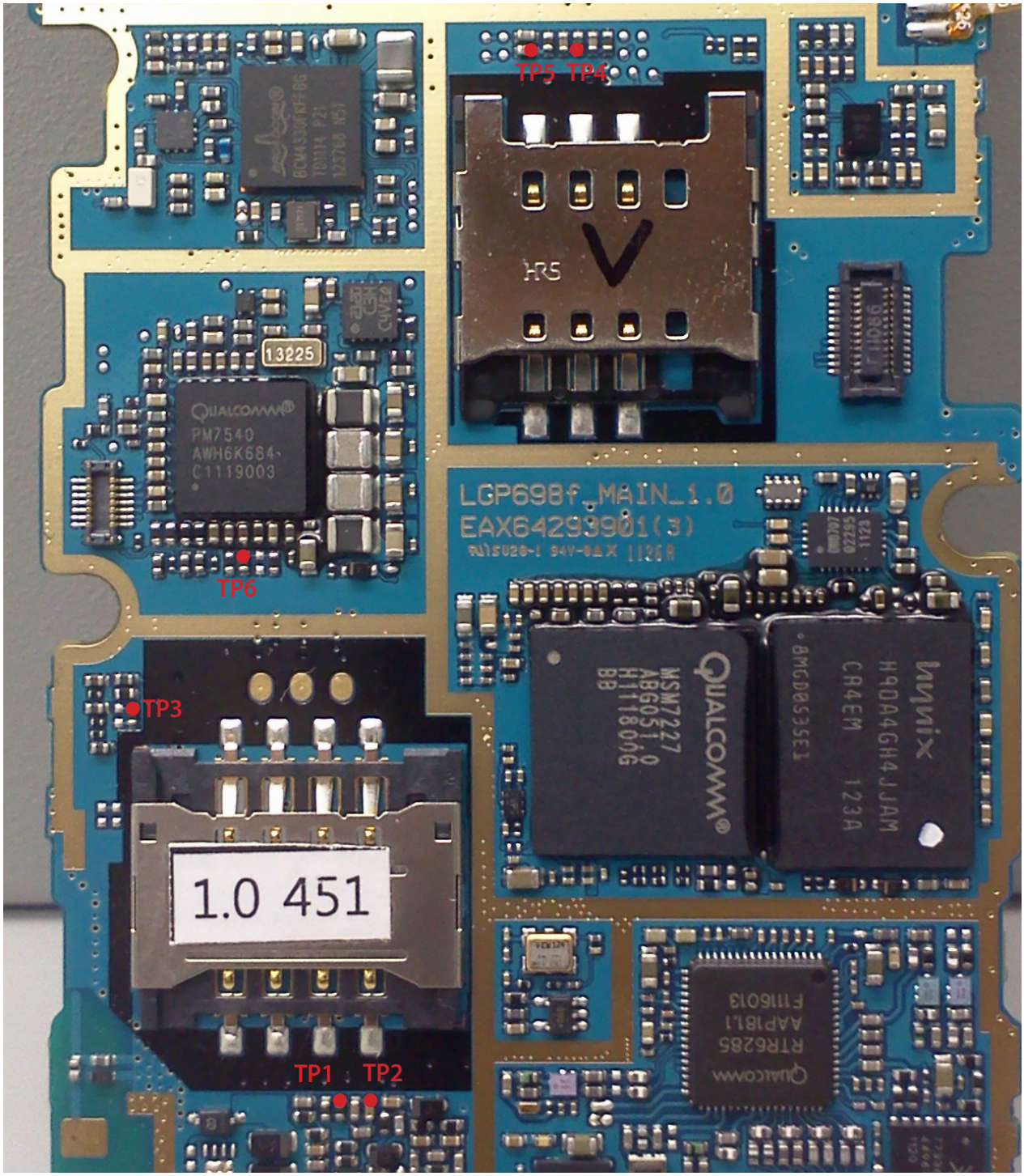
Measurement
VREG_RUIM1_3.0V & VREG_RUIM2_3.0V
SIM1_RST & SIM2_RST
SIM1_IO & SIM2_IO

USIM1 Socket



USIM2 Socket



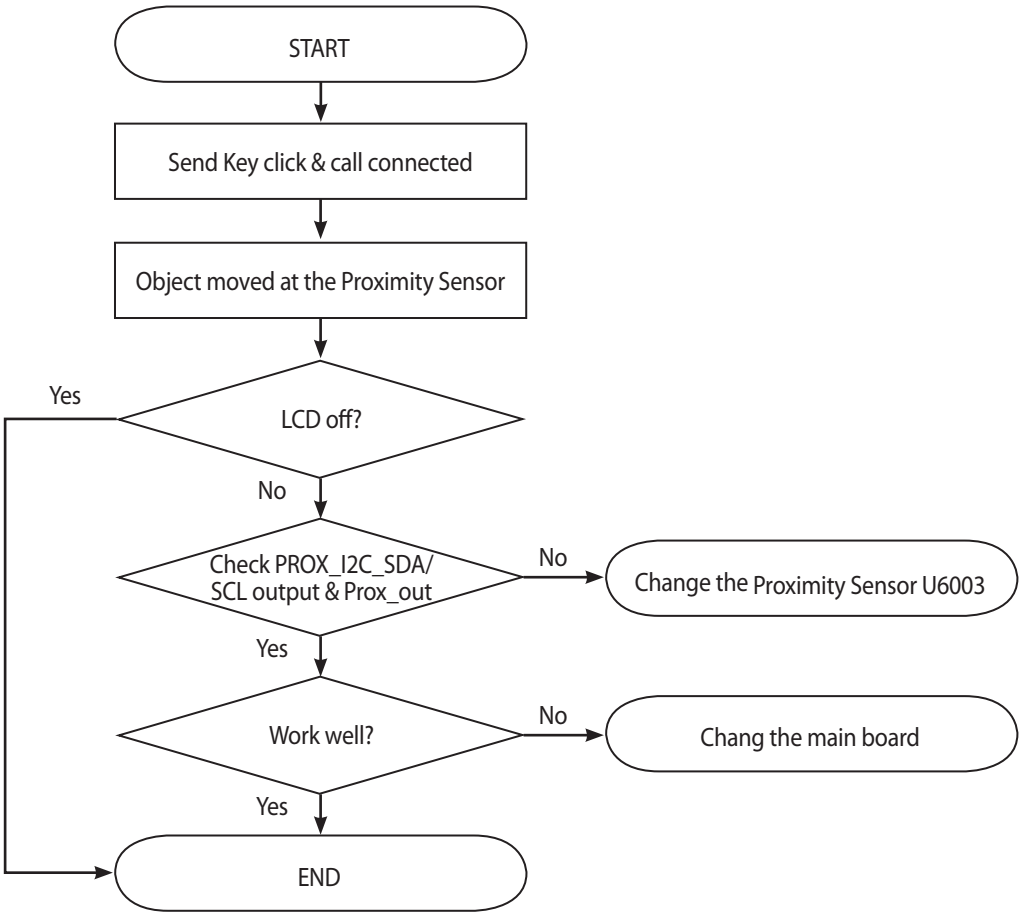


4.15 Proximity Sensor on/off Trouble Shooting

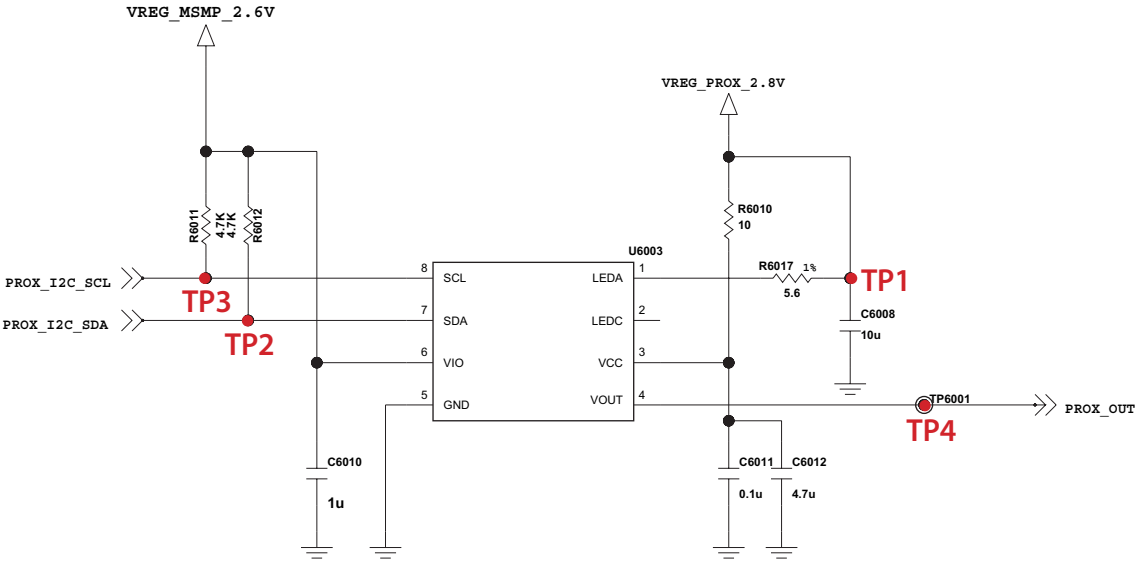
Proximity Sensor is worked as below :

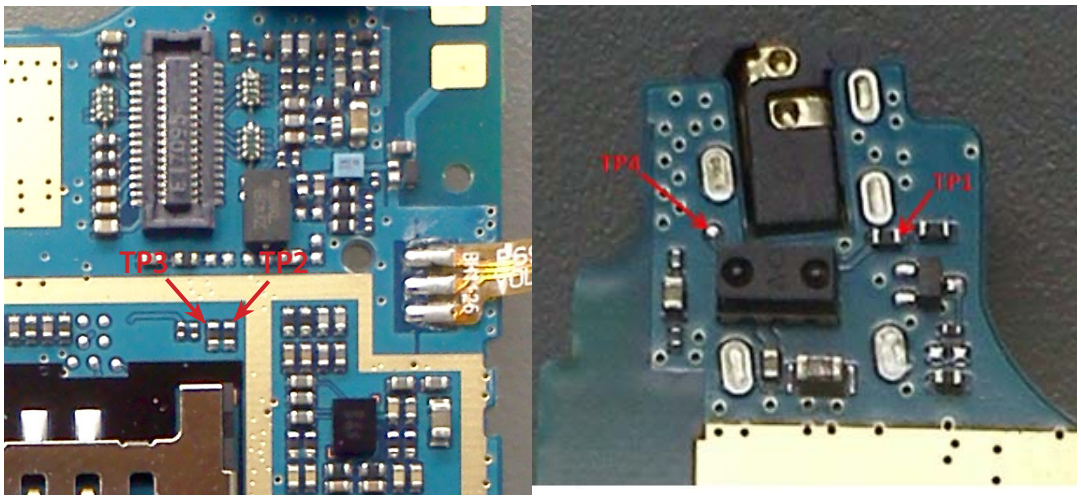
Send Key click → Phone number click → Call connected → Object moved at the sensor →

Control the screen's on/off operation automatically



Measurement
VREG_MSMP_2.6V
VREG_PROX_2.8V
PROX_OUT
PROX_I2C_SCL / SDA

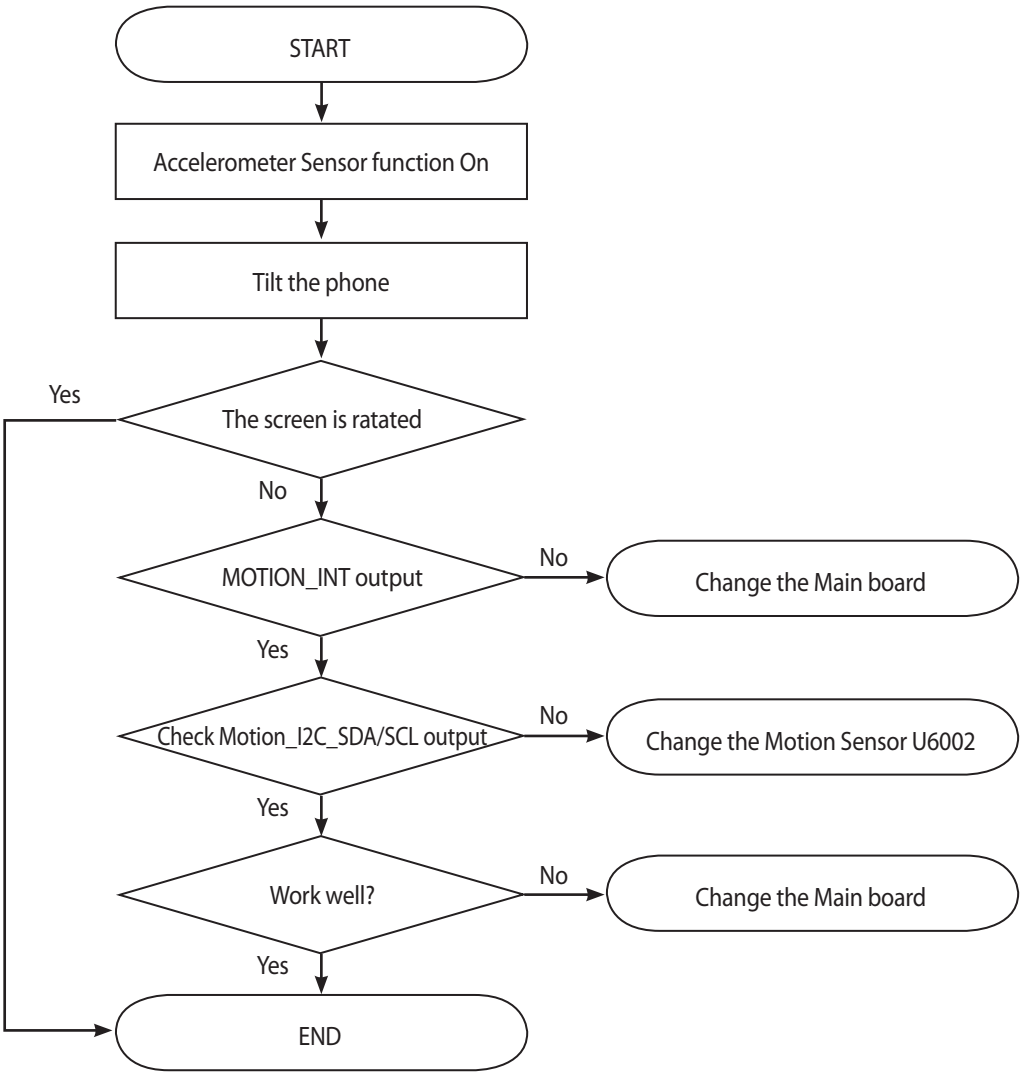




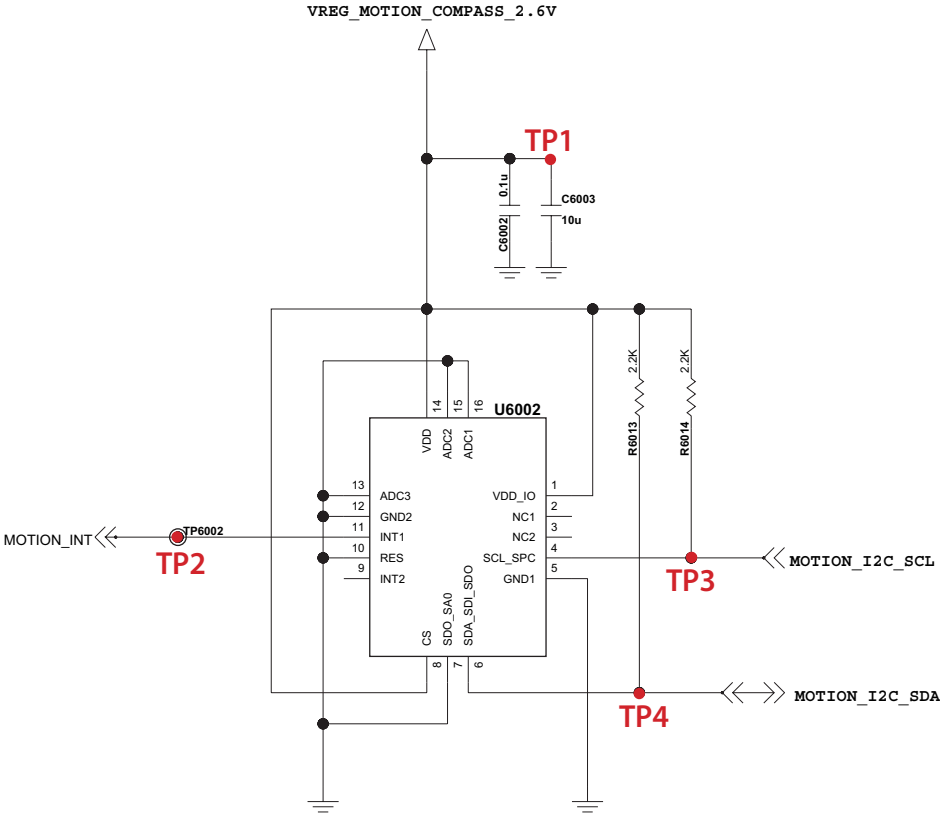
4.16 Motion Sensor on/off Trouble Shooting

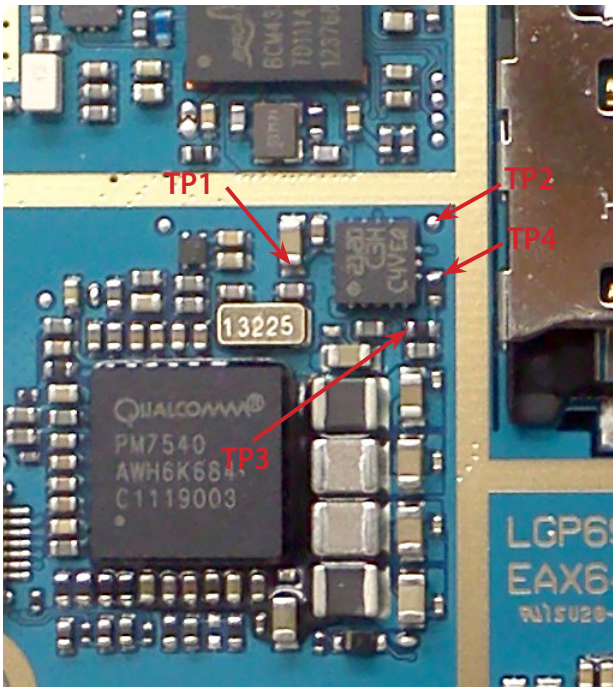
Motion Sensor is worked as below :

Accelerometer Sensor function On → Tilt the phone (90˚) → The screen is had rotated automatic



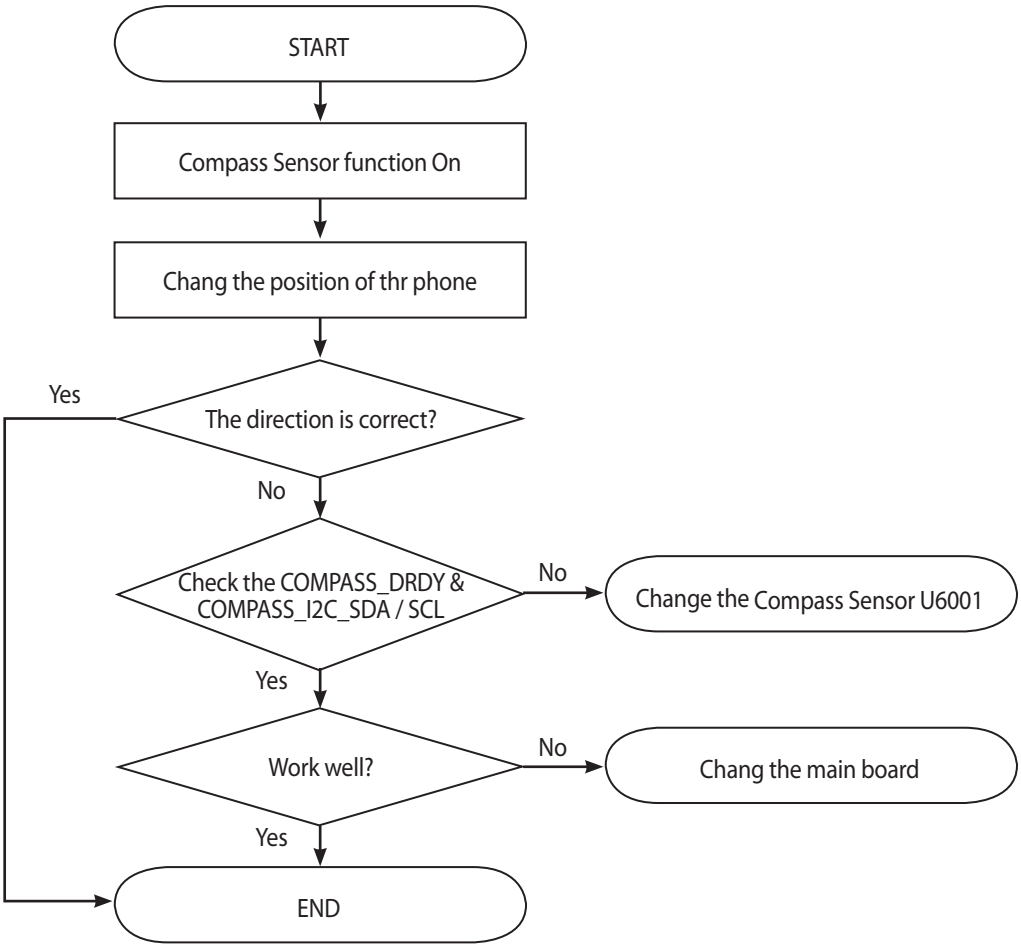
Measurement
VREG_MOTION_COMPASS_2.6V
MOTION_INT
MOTION_I2C_SDA / SCL



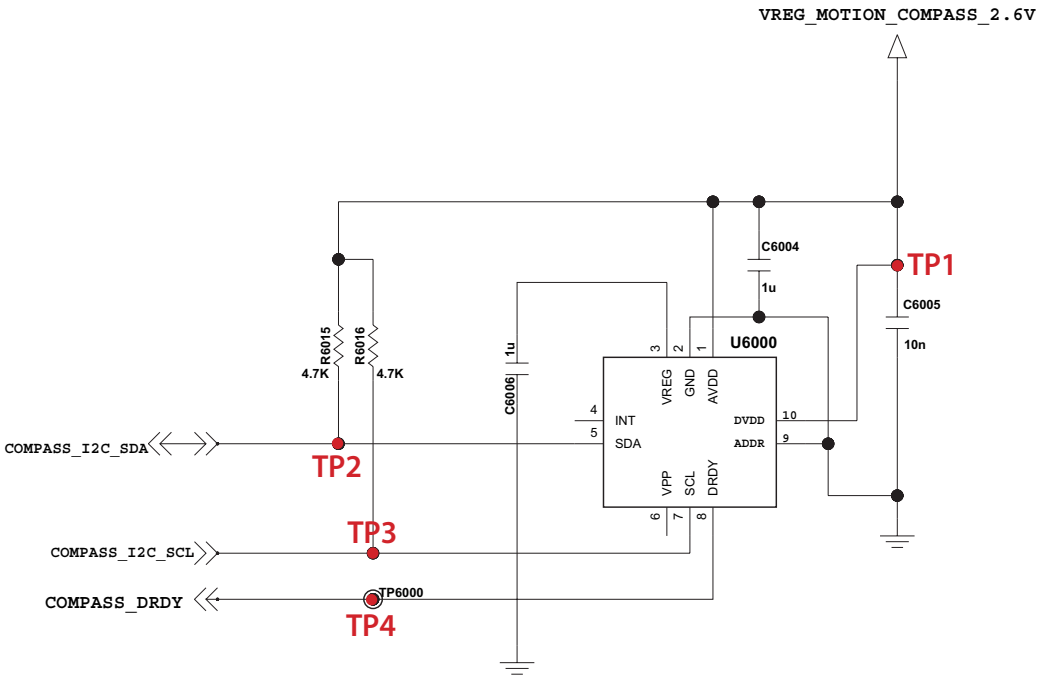


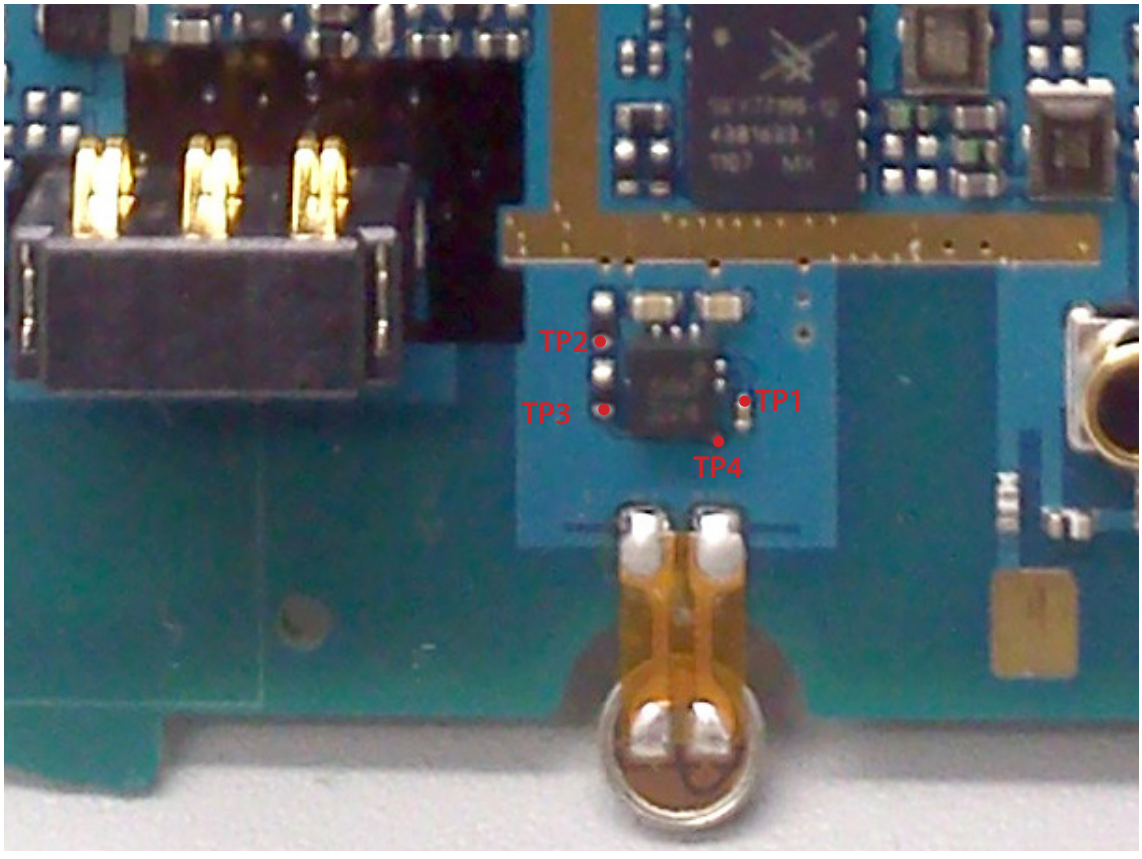
4.17 Compass Sensor on/off Trouble Shooting

Compass Sensor is worked as below : Compass Sensor function On



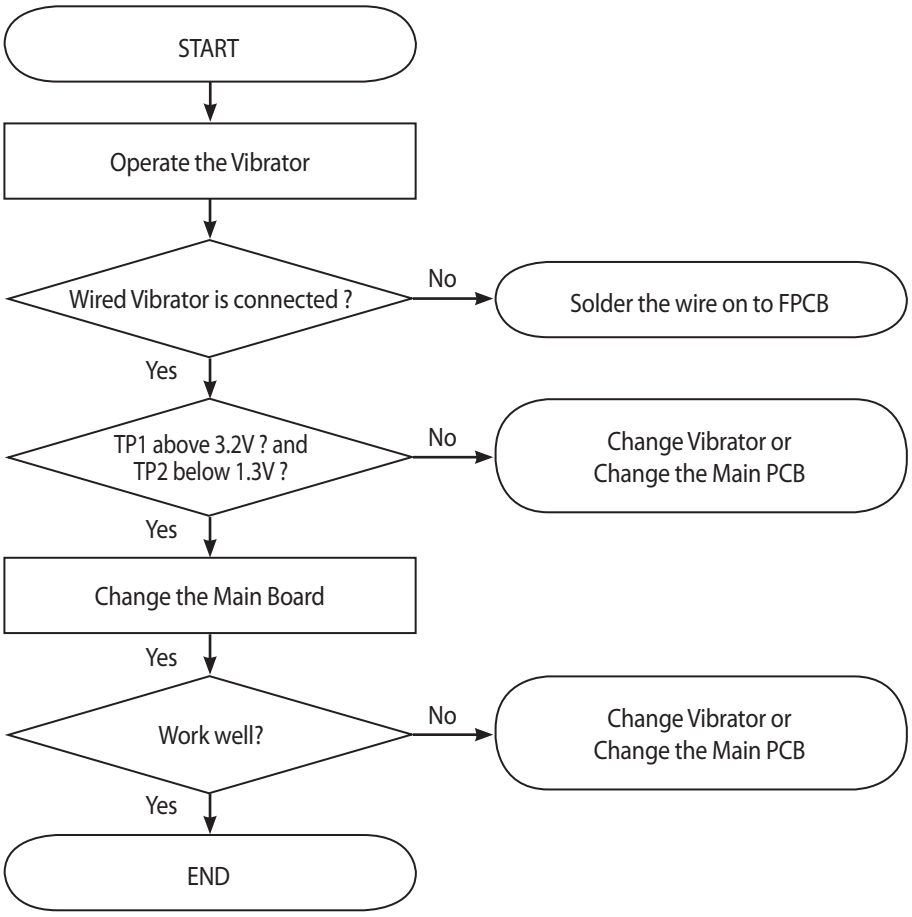
Measurement
VREG_MOTION_COMPASS_2.6V
COMPASS_I2C_SCL / SDA
COMPASS_DRDY



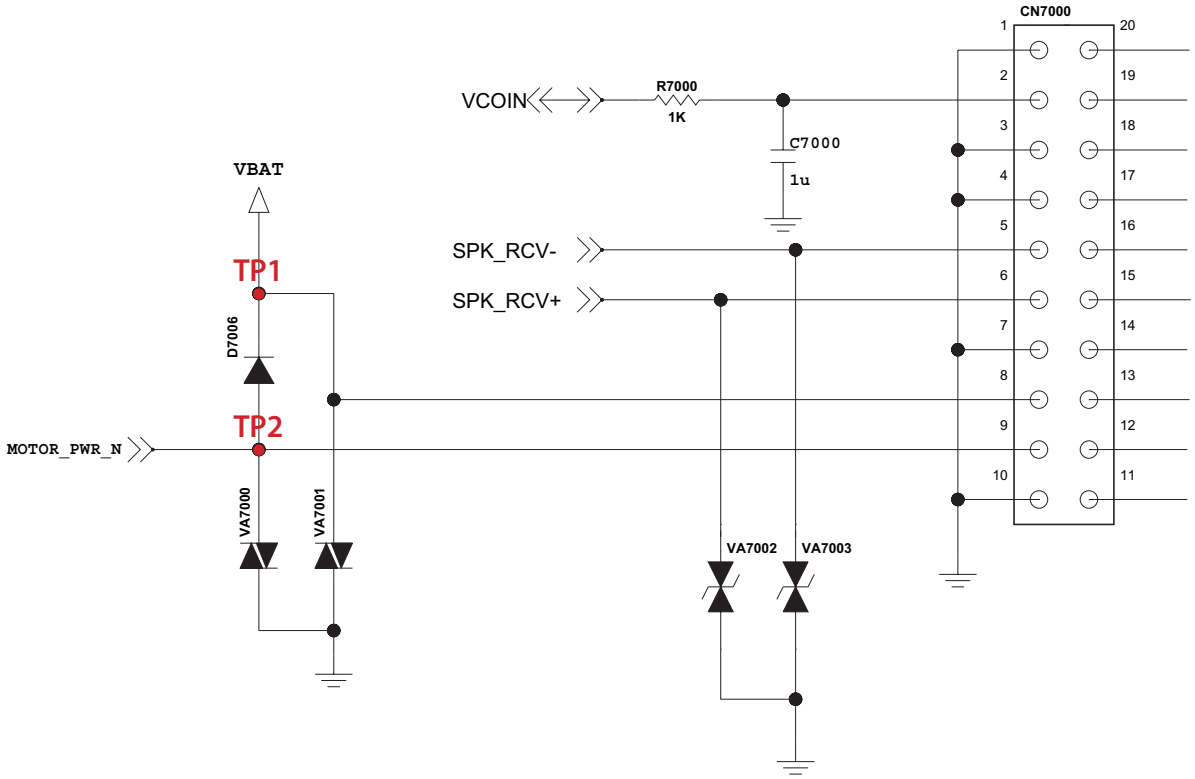


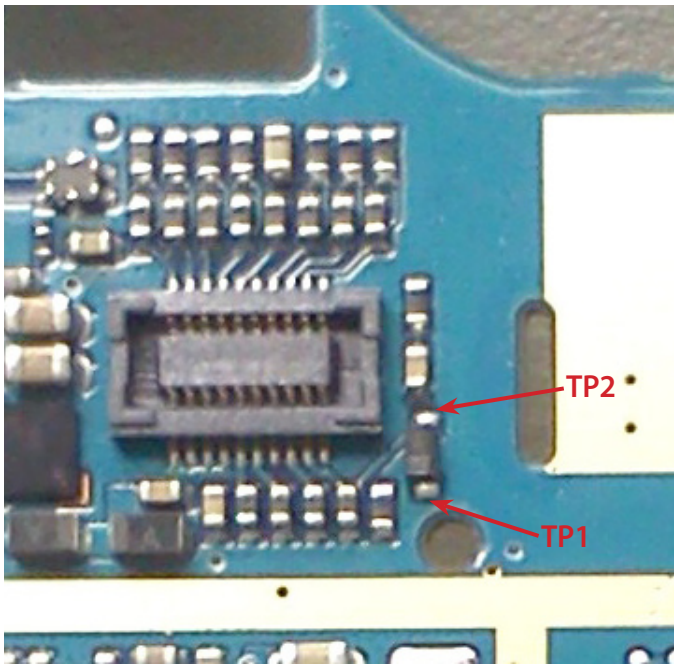
4.18 DC Motor Trouble Shooting

Vibrator is operate when DC motor driver (audio amp) is enabled.

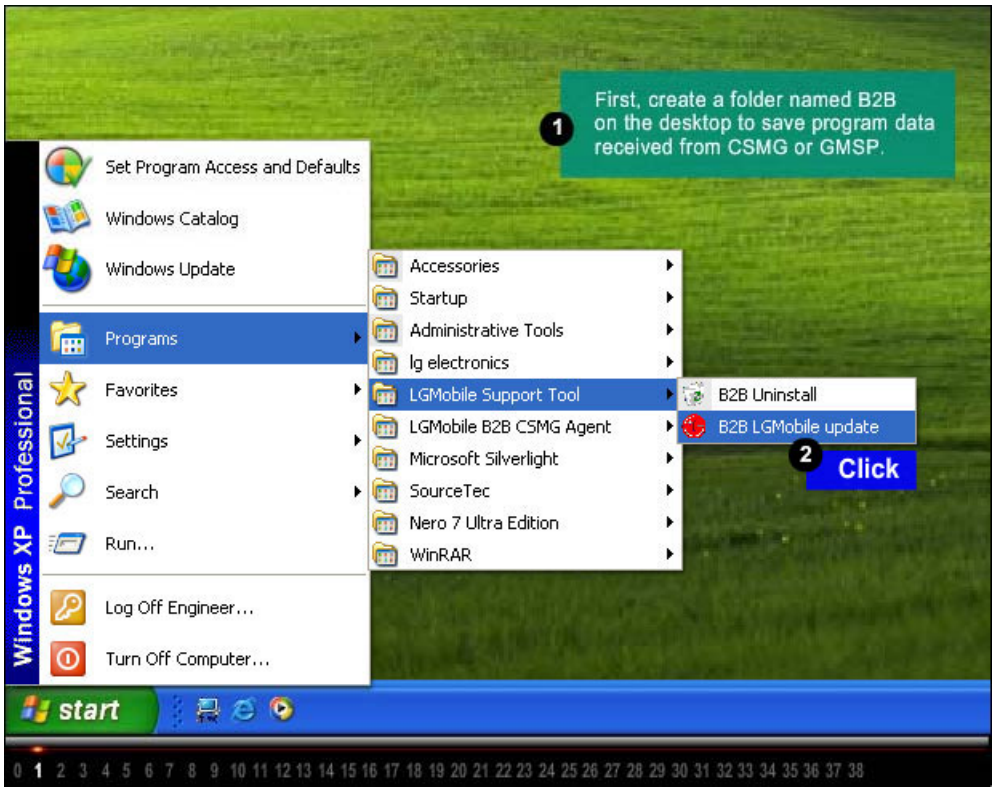


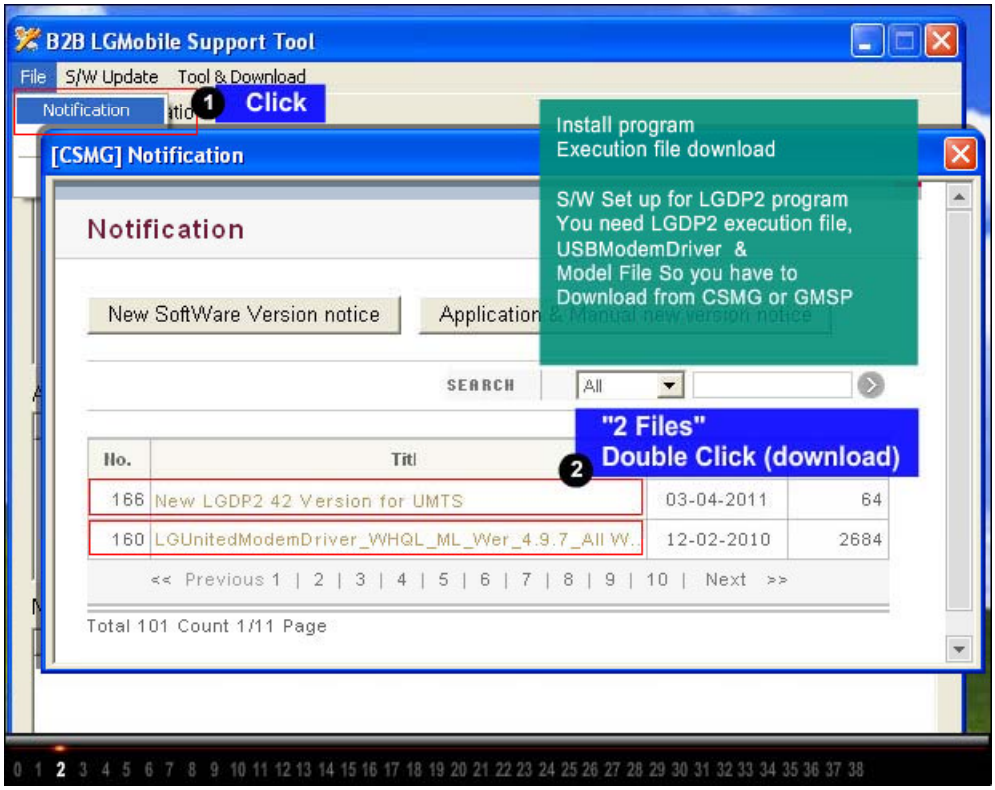
Measurement
VBAT
MOTOR_PWR_N

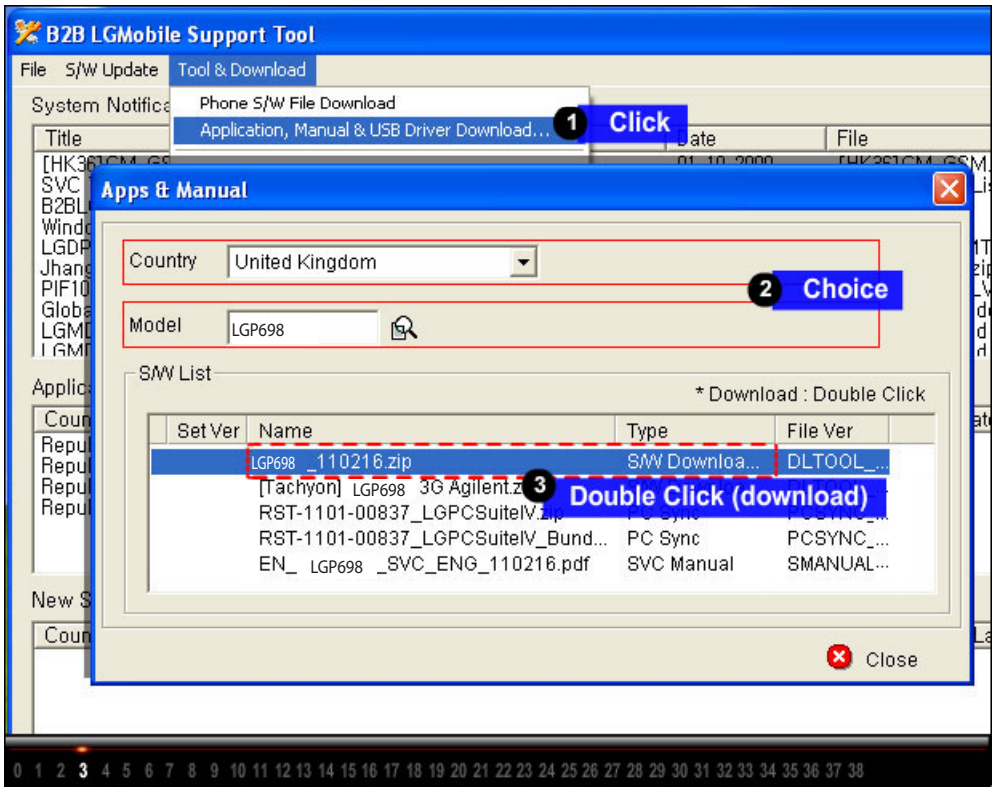


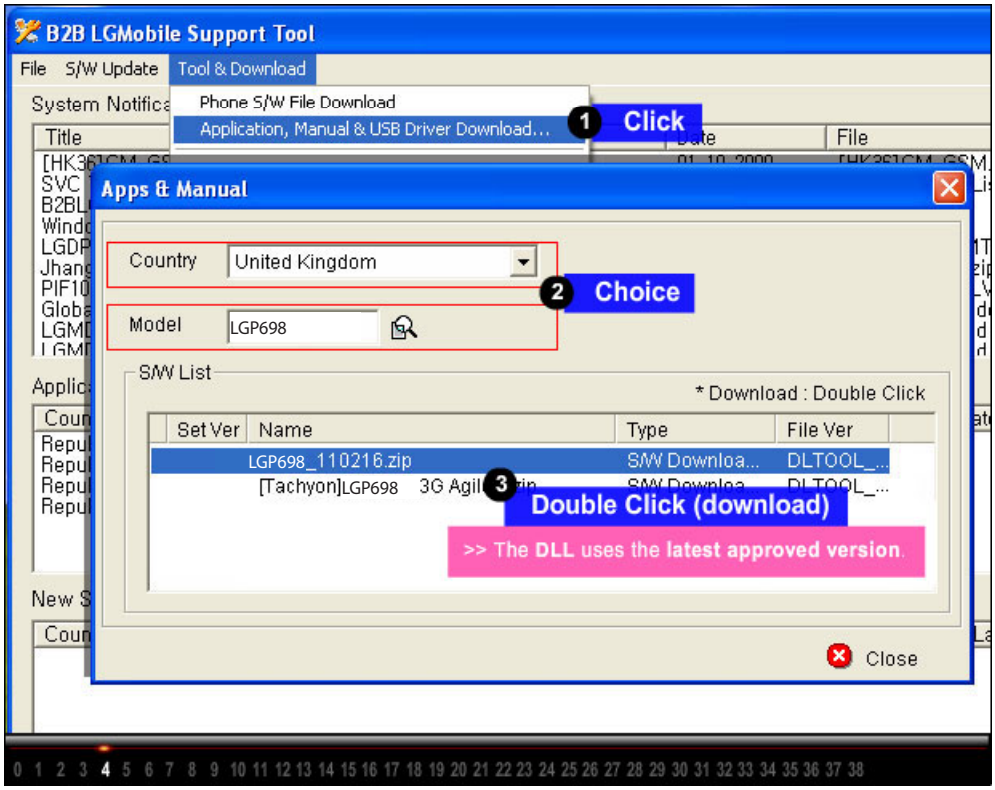


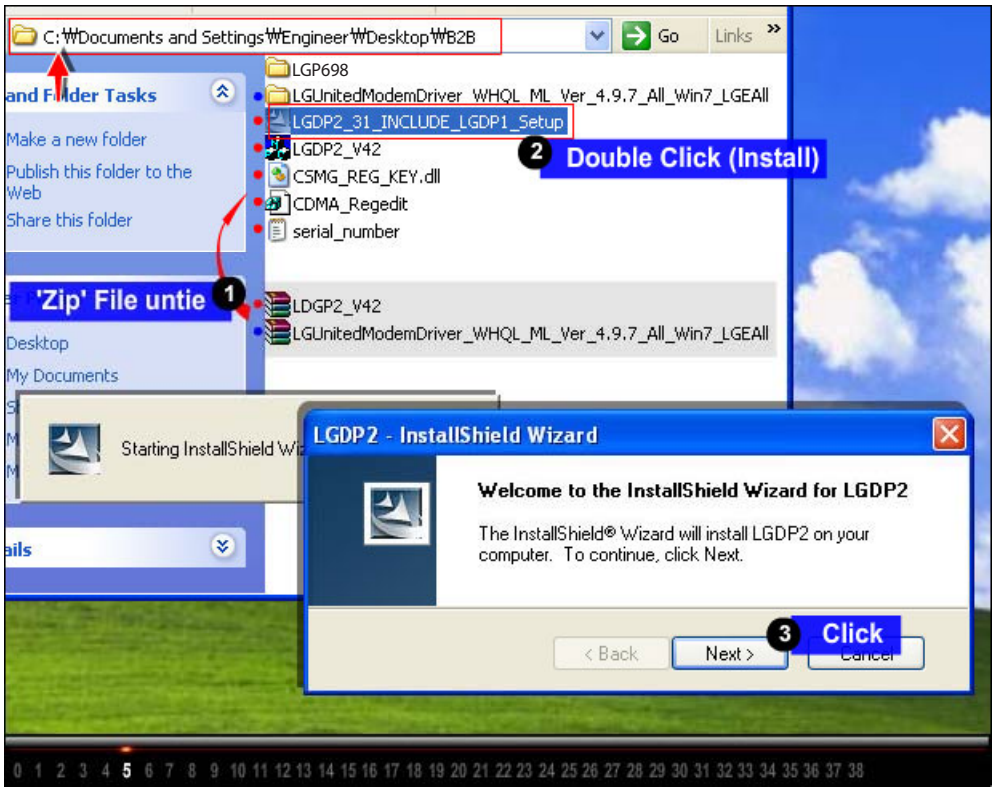
5. DOWNLOAD

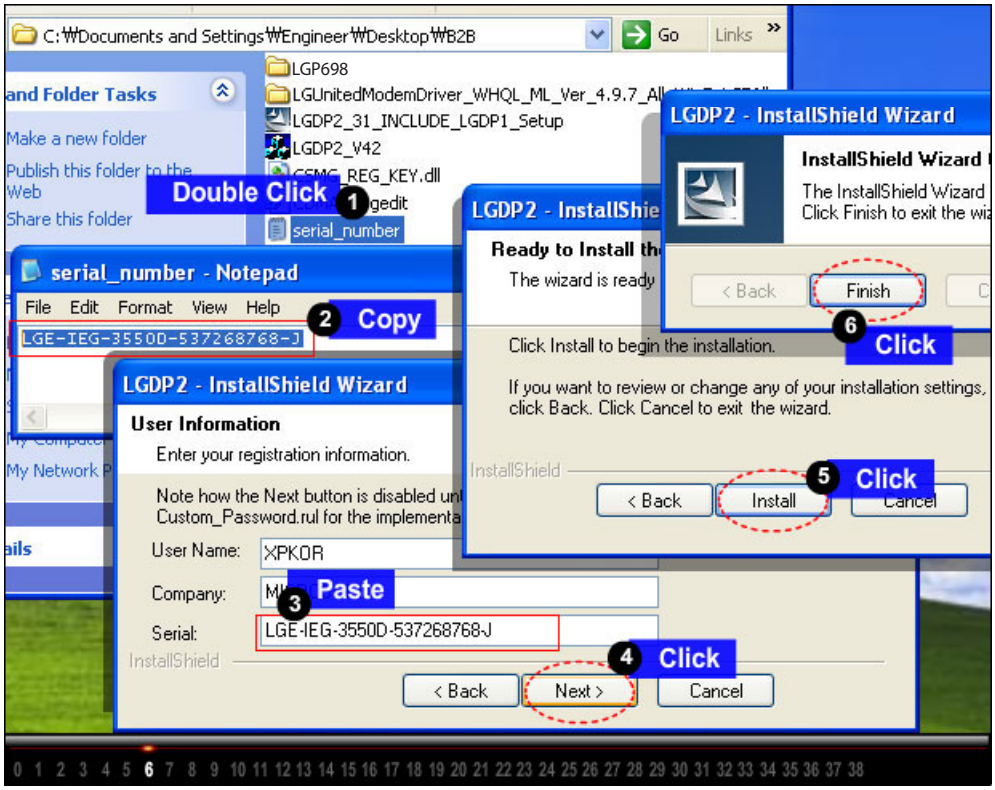


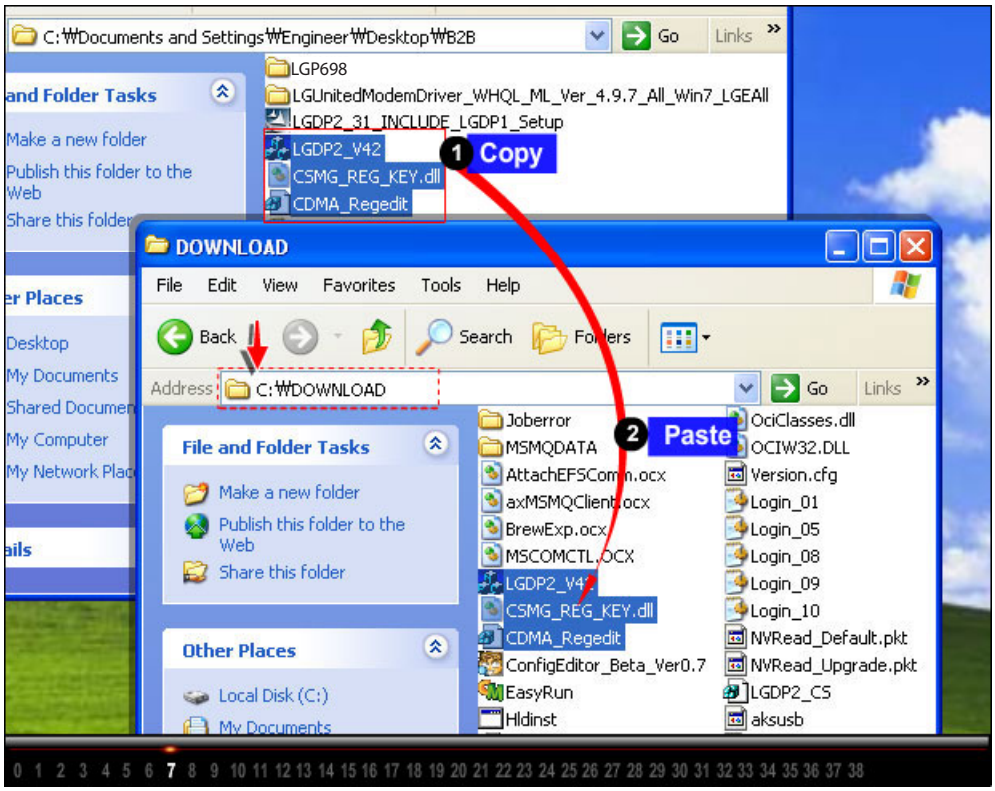


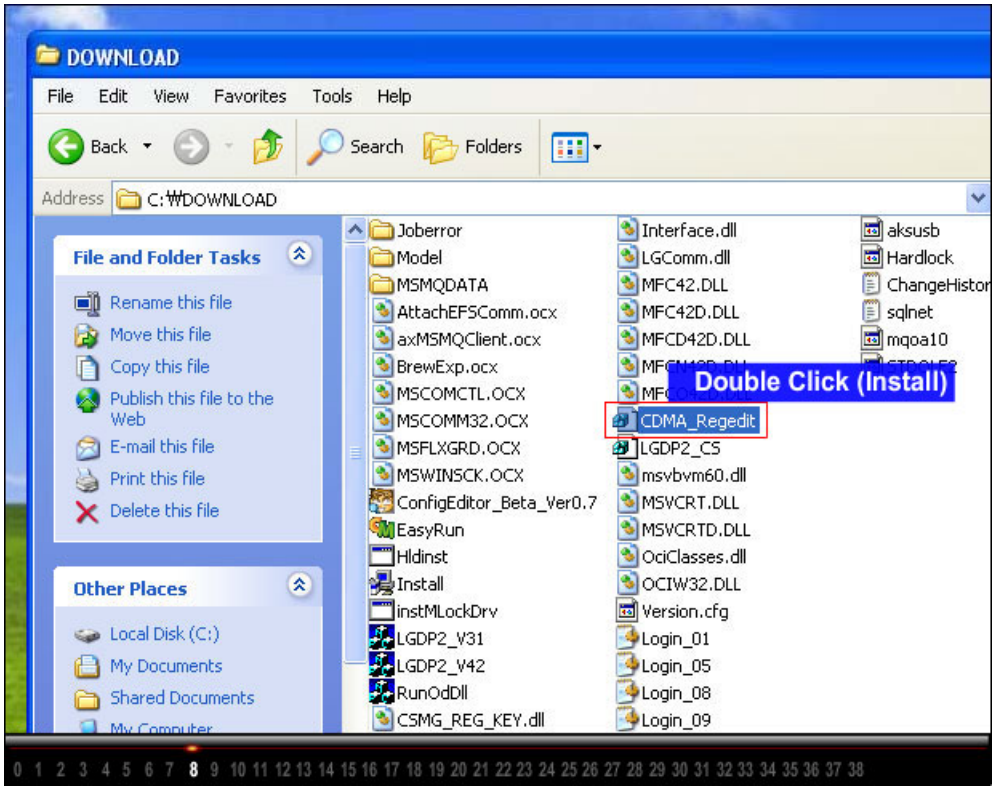


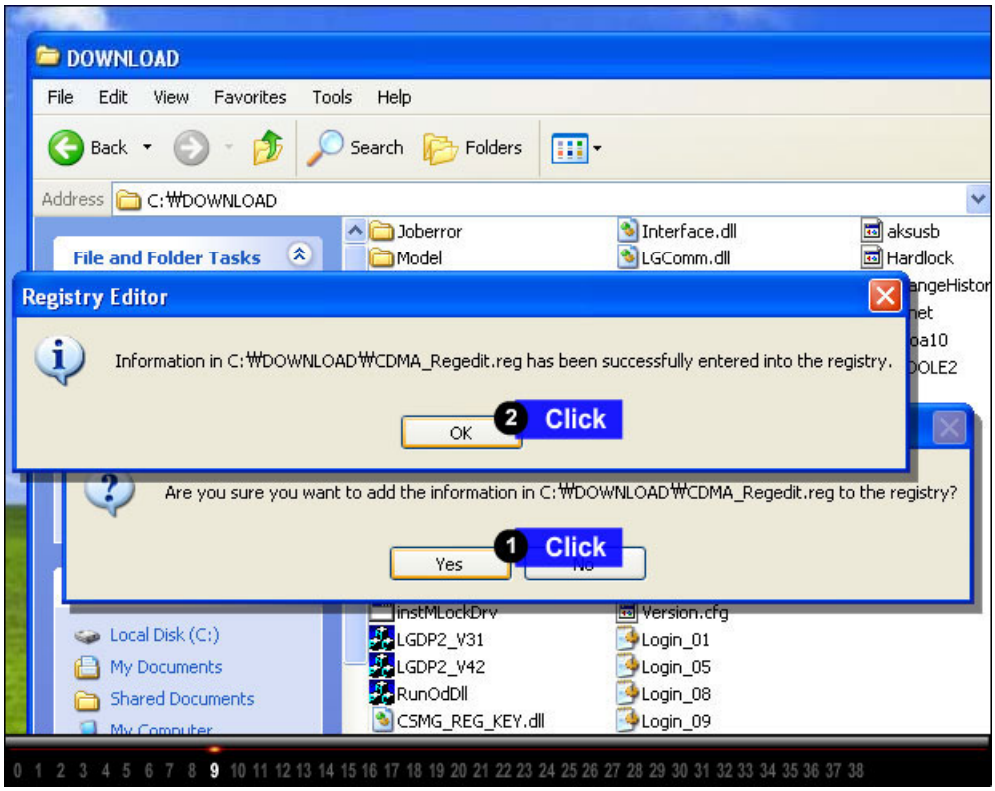


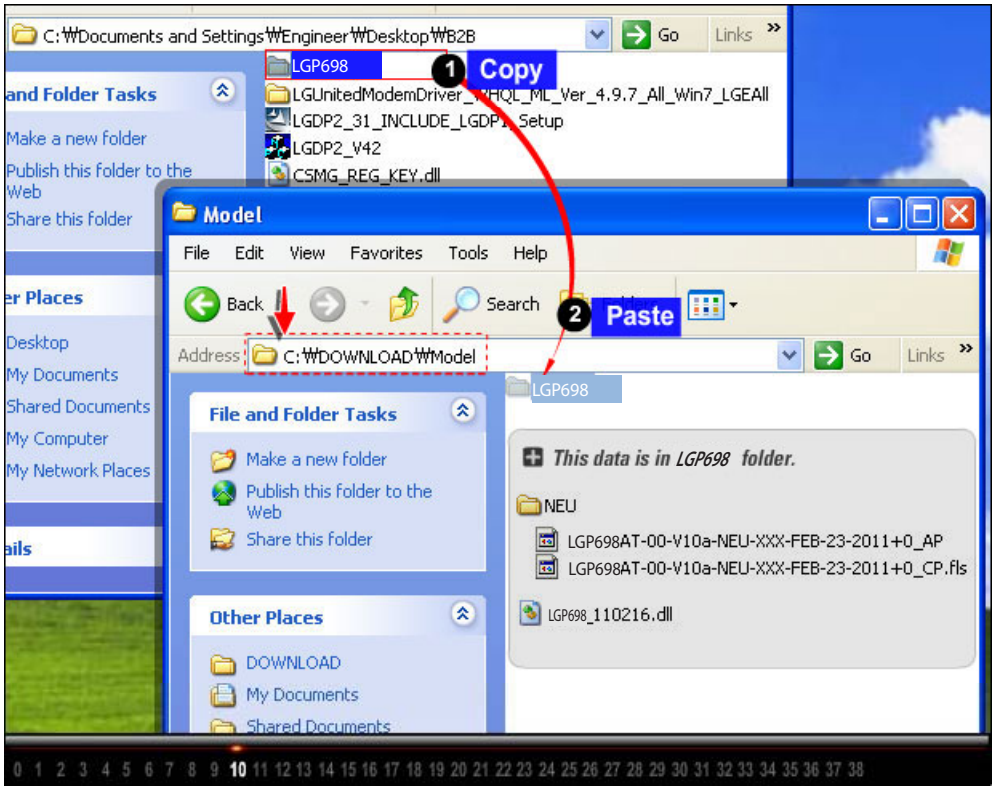


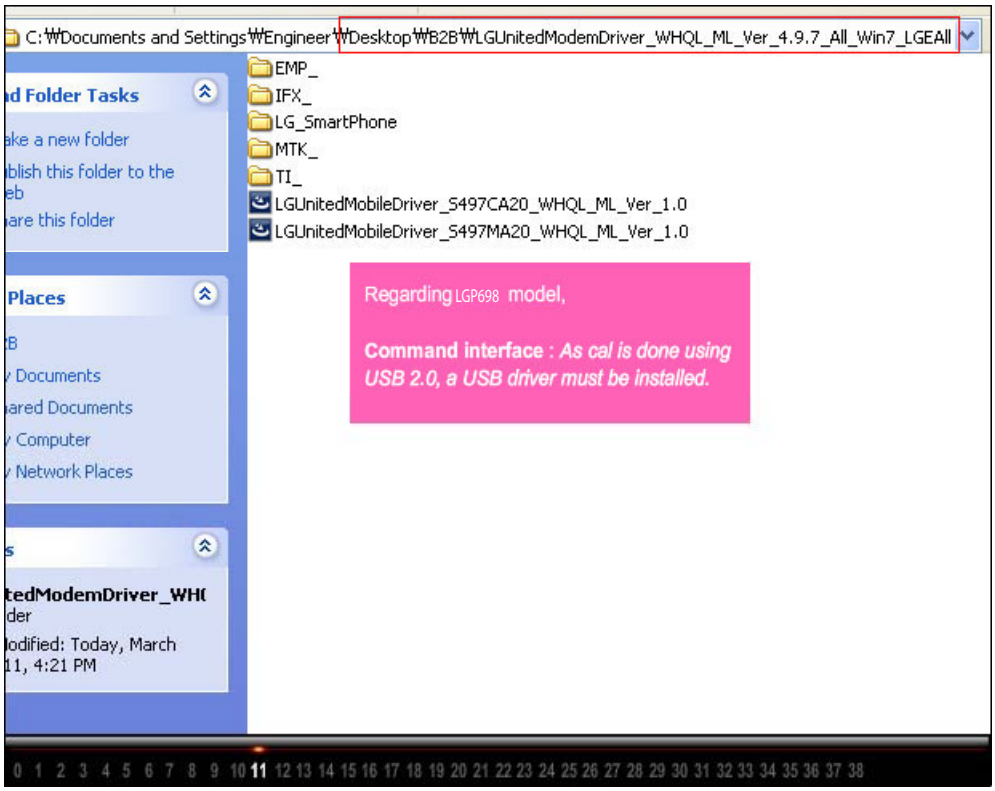


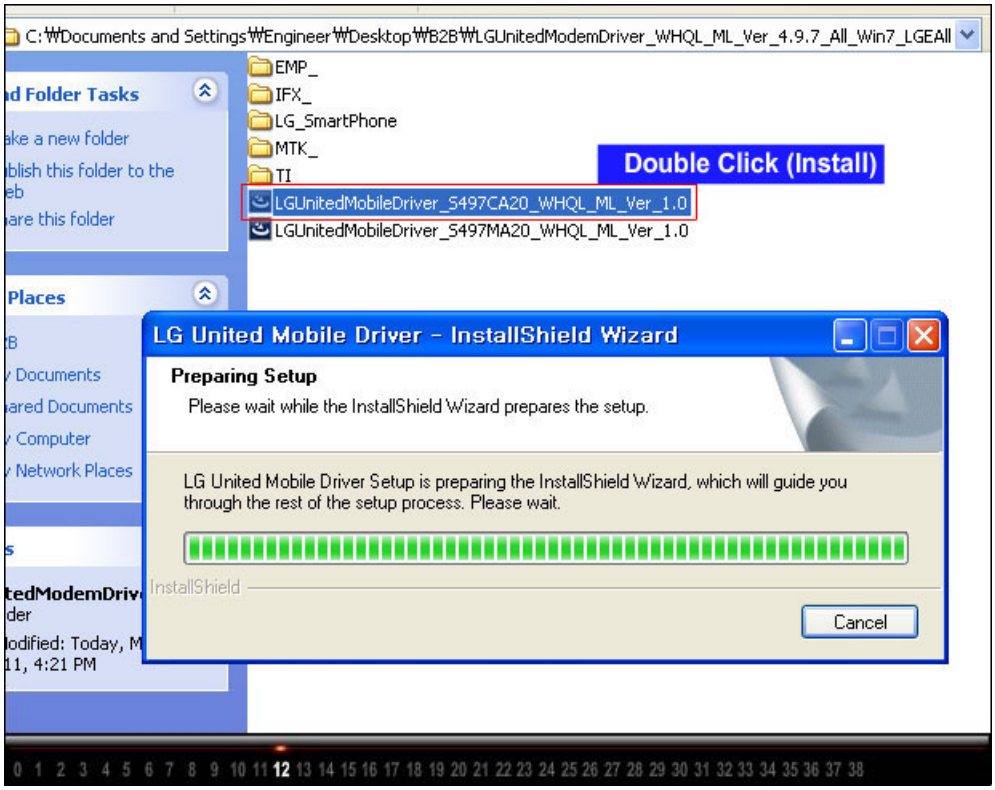


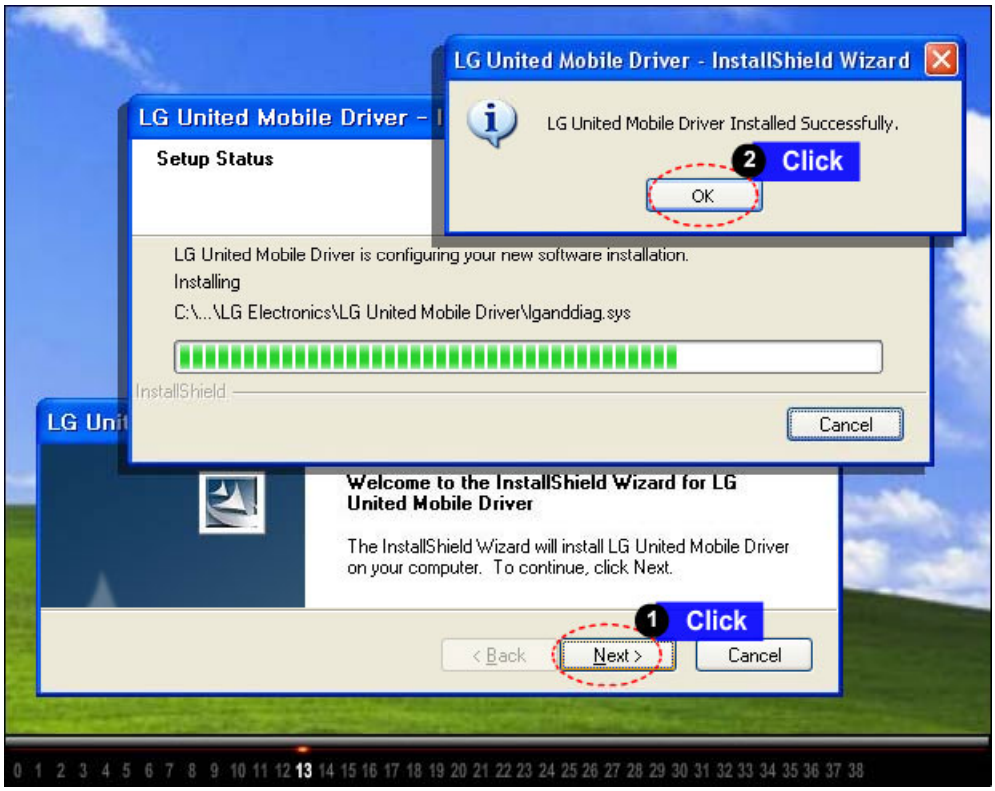


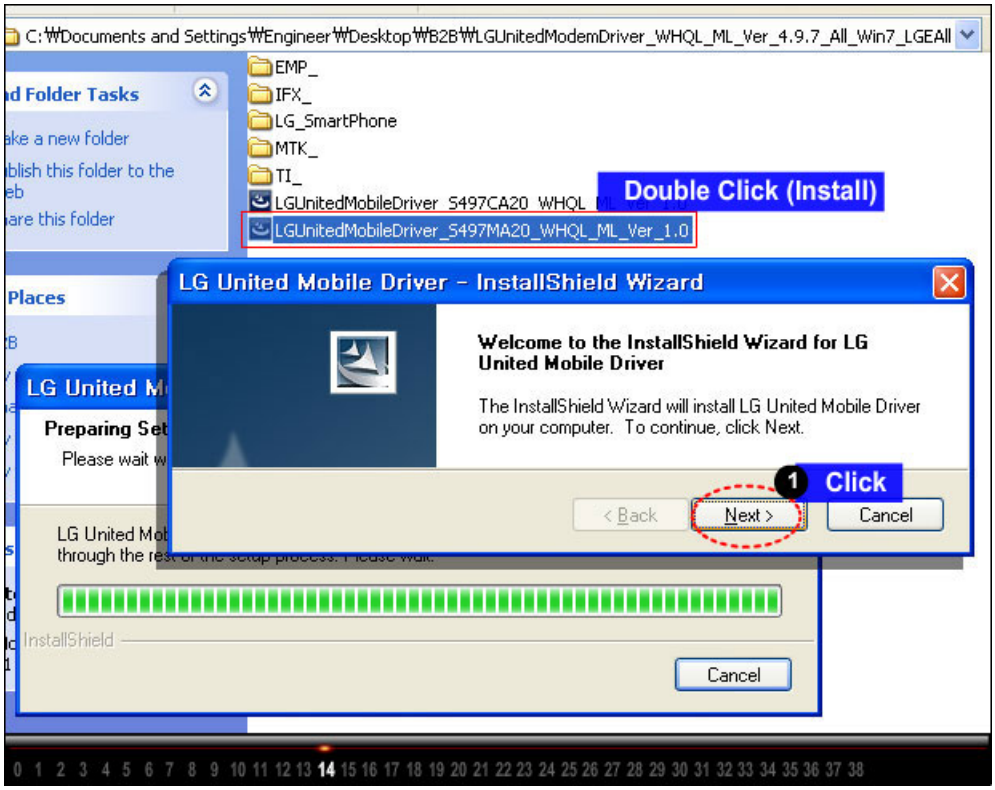


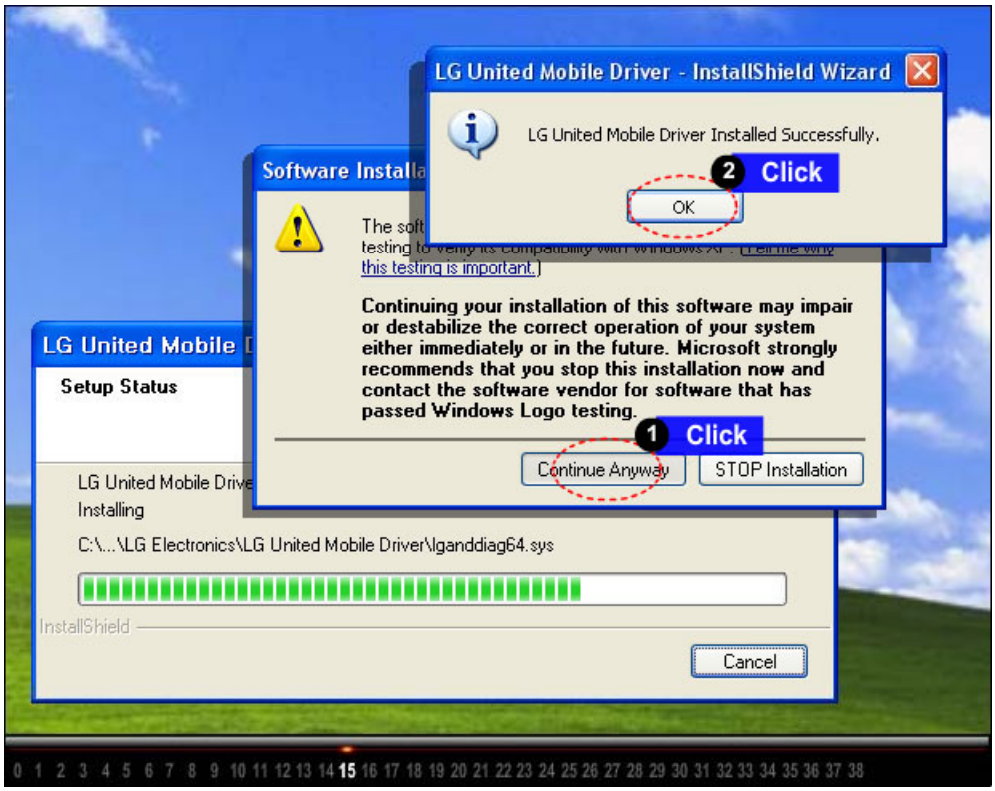


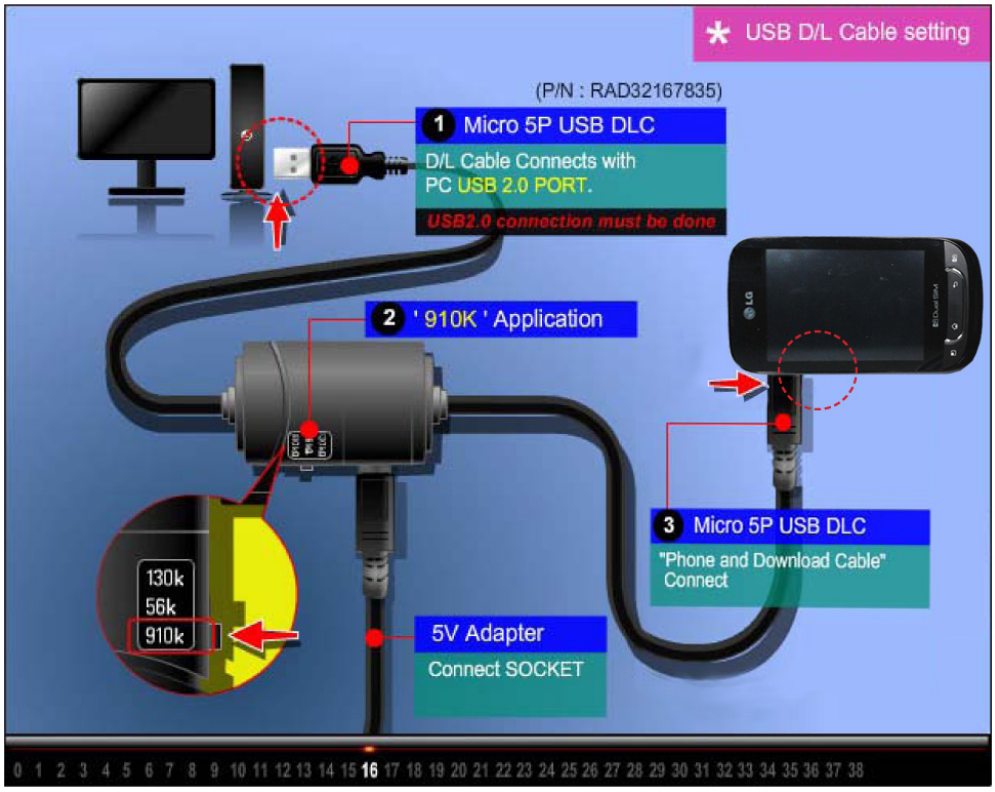


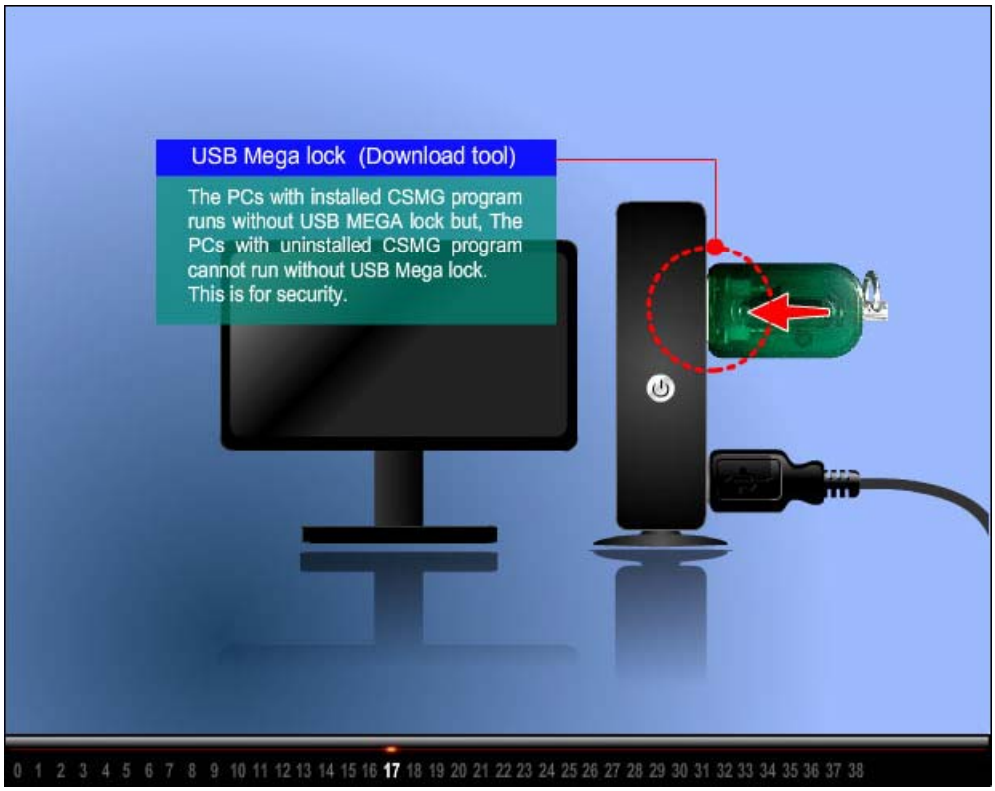


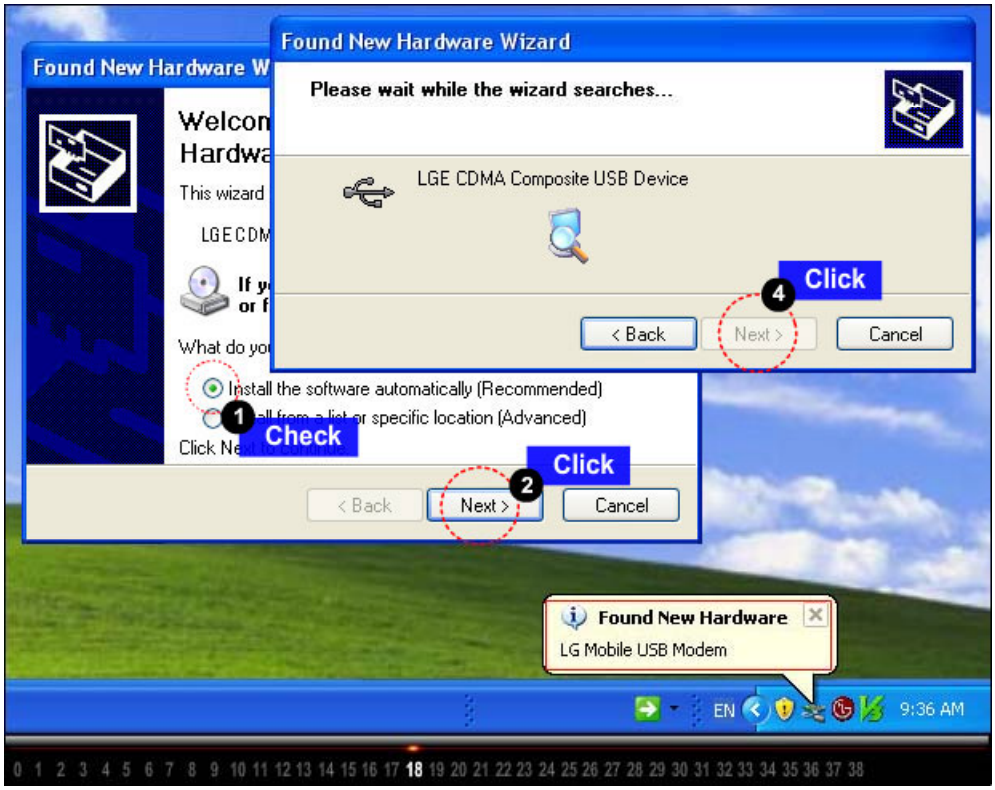


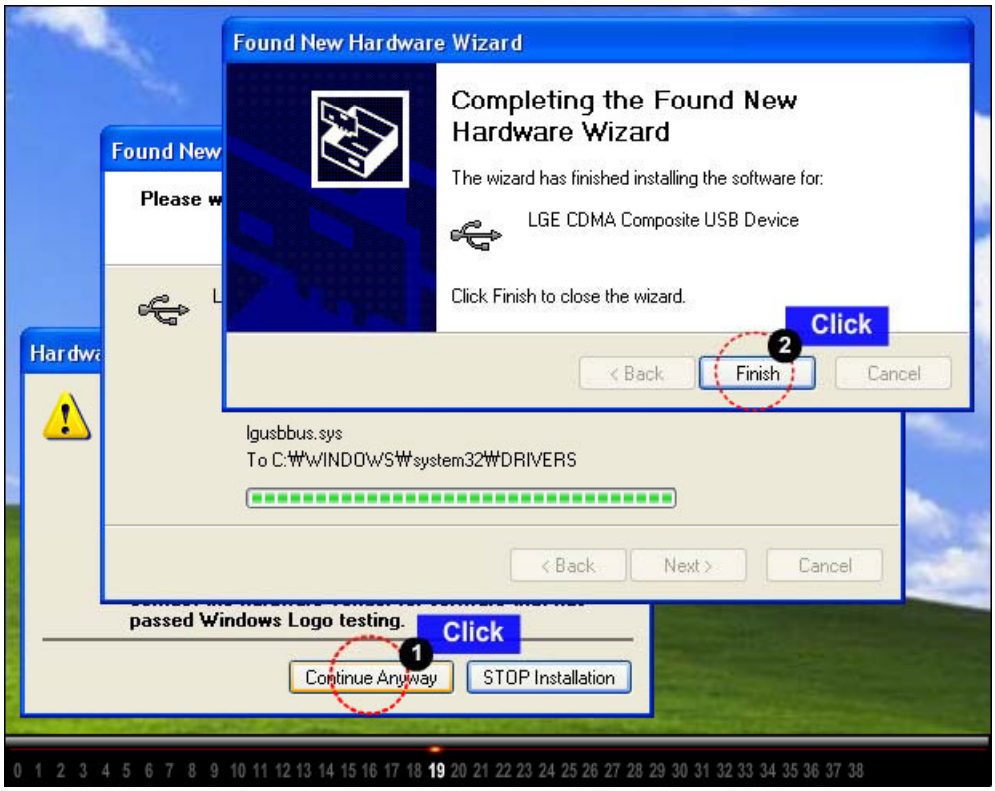


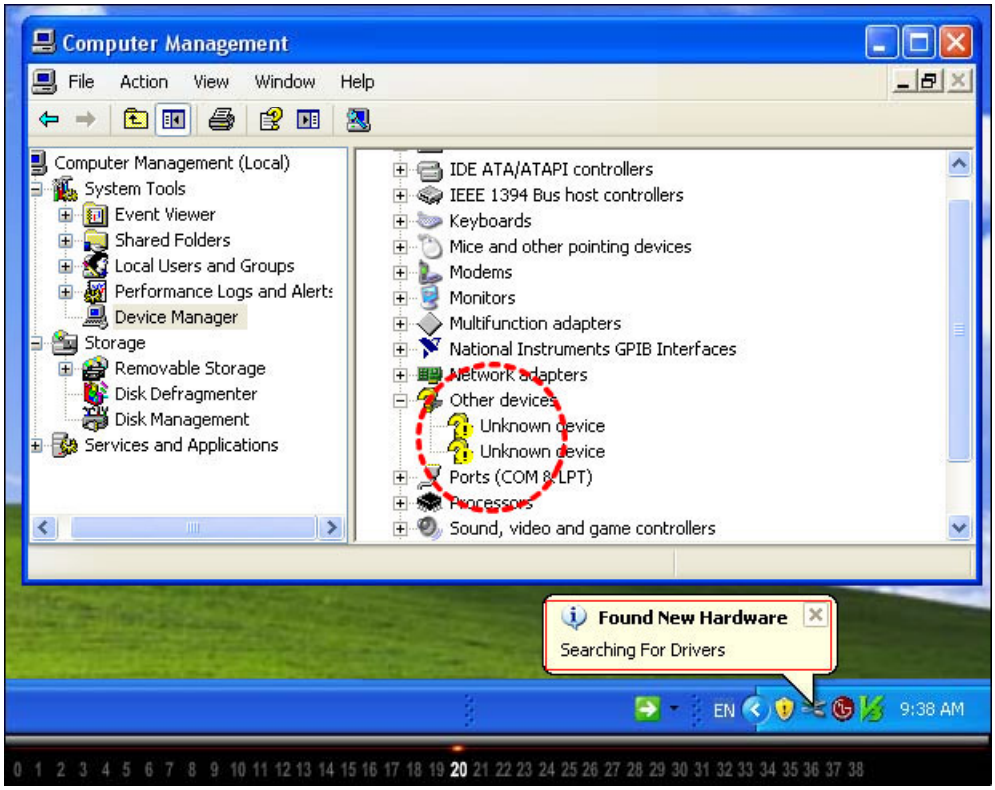


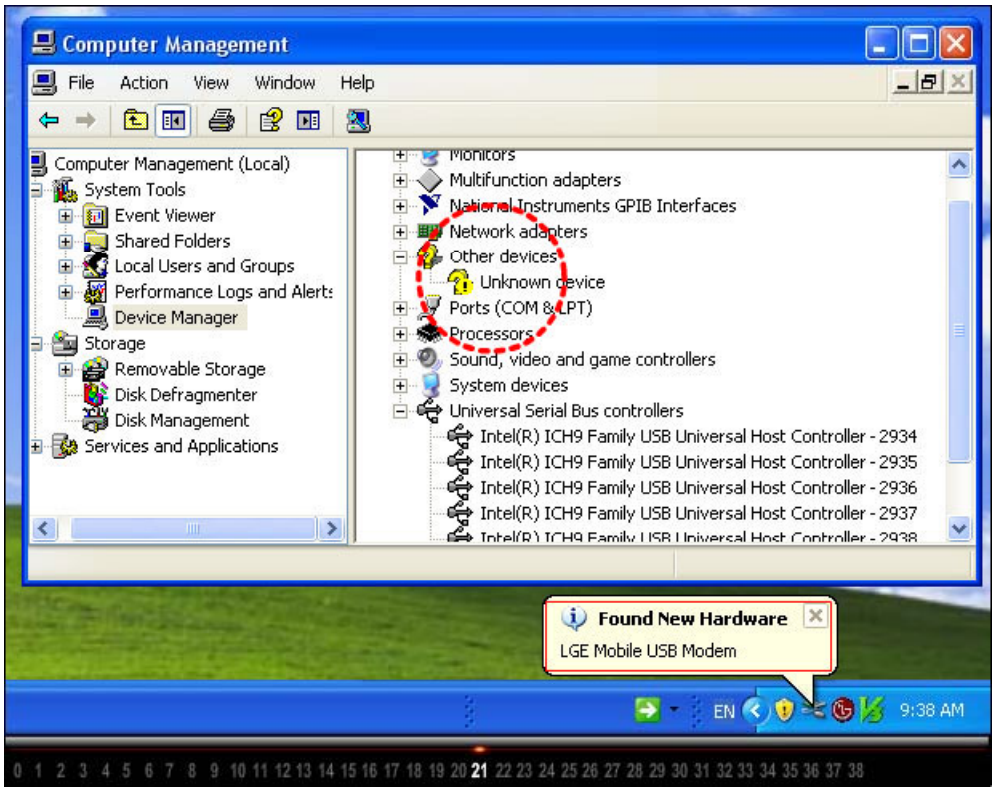


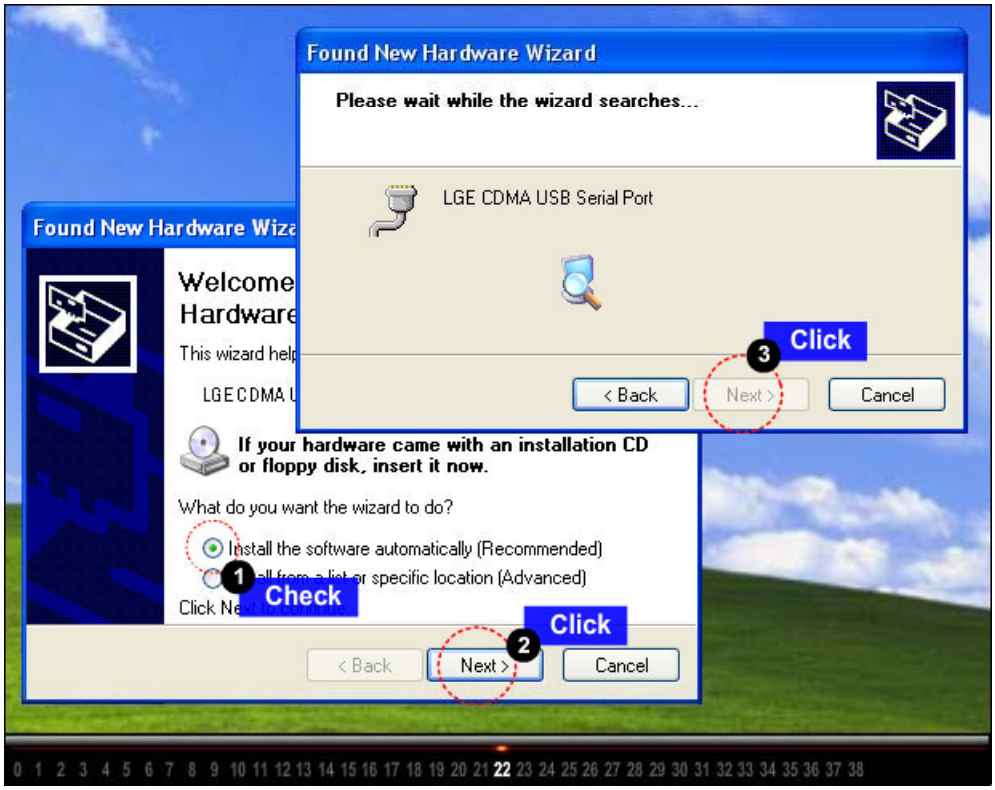


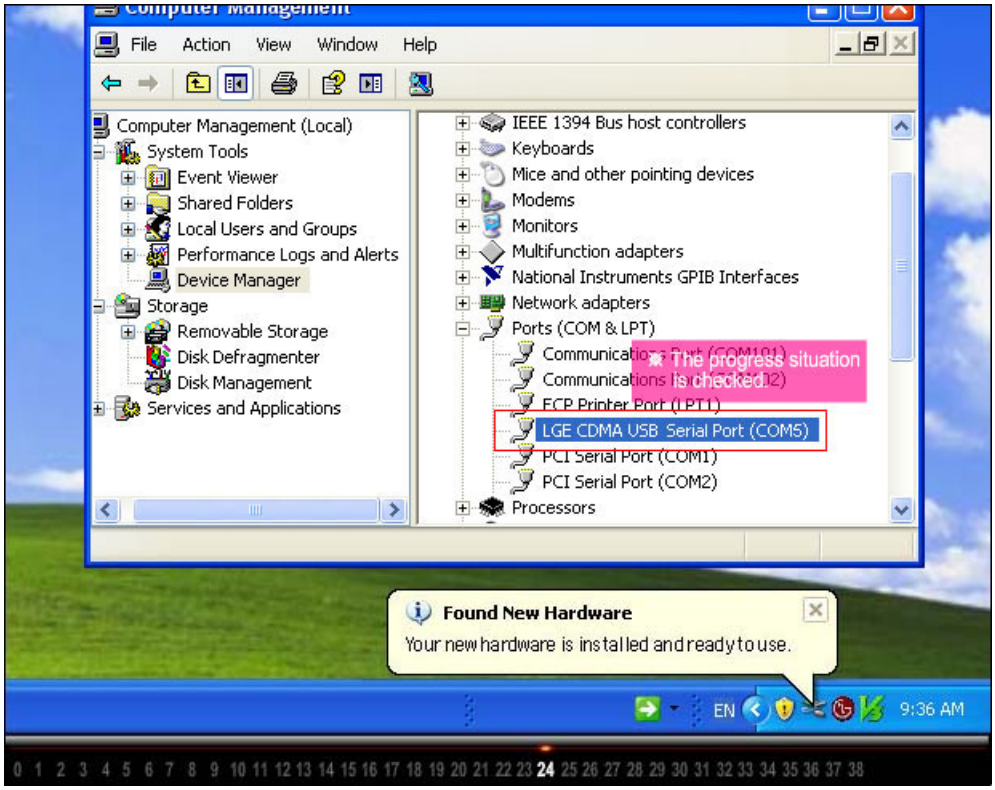


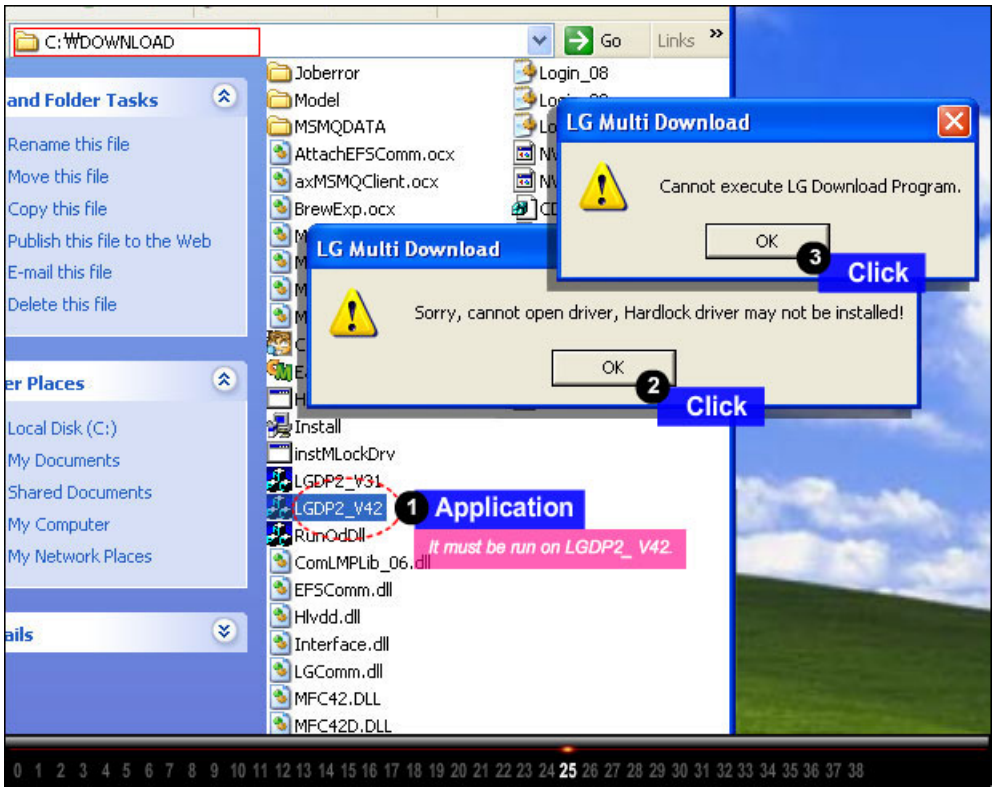


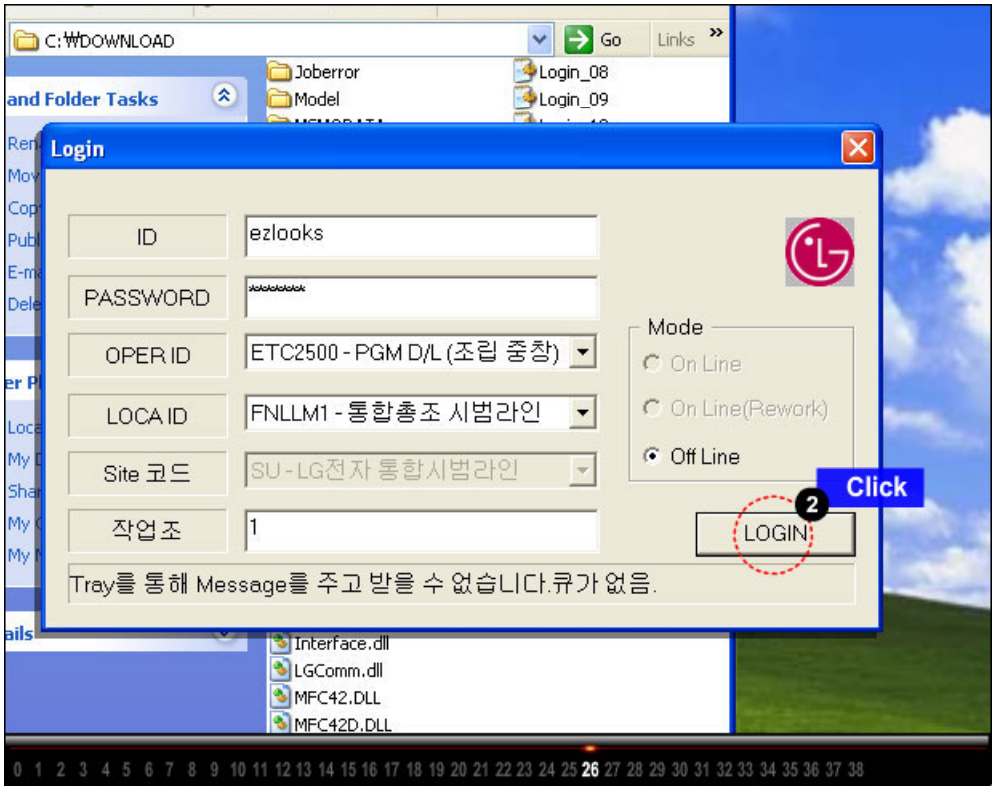


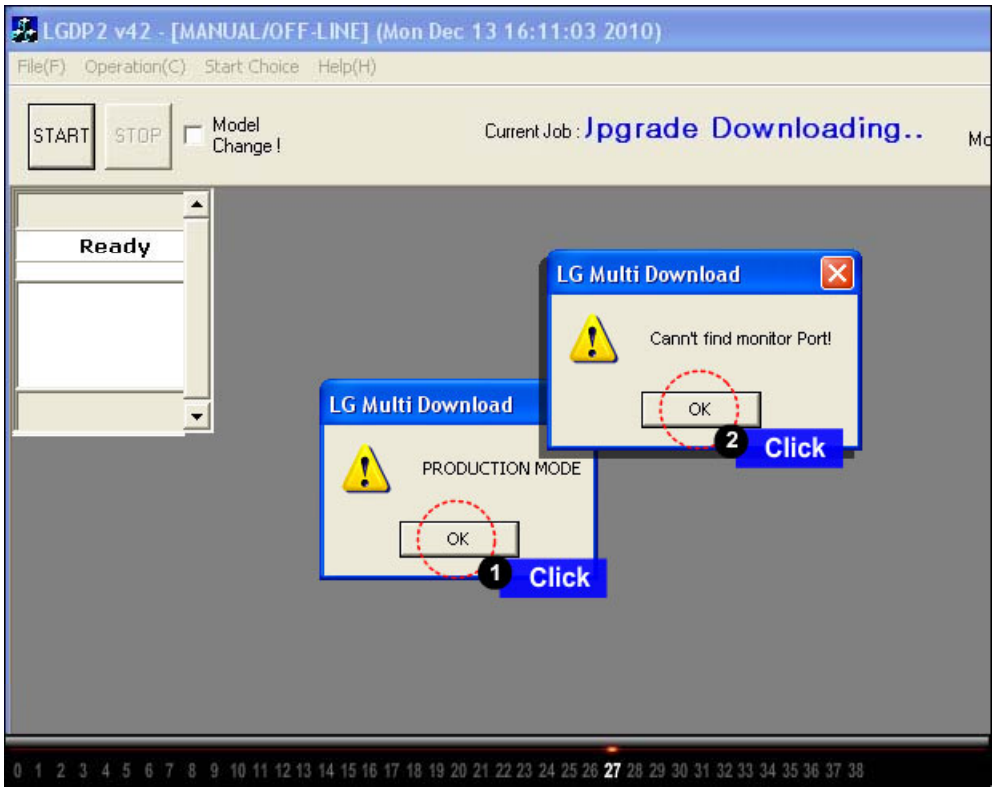


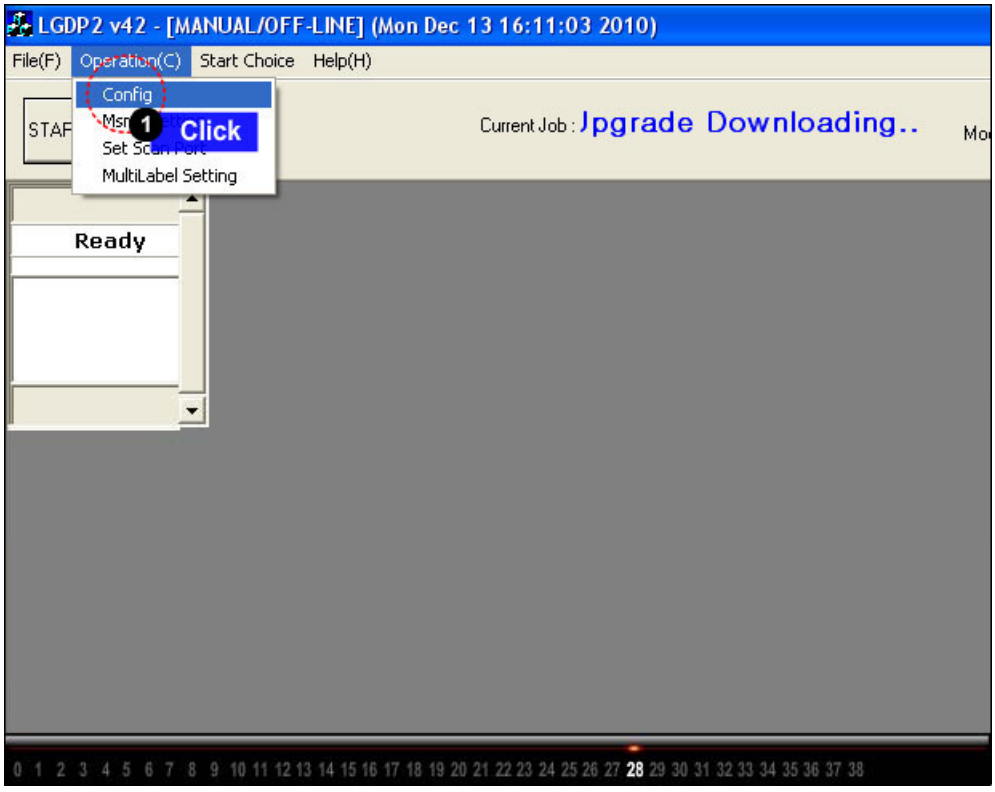


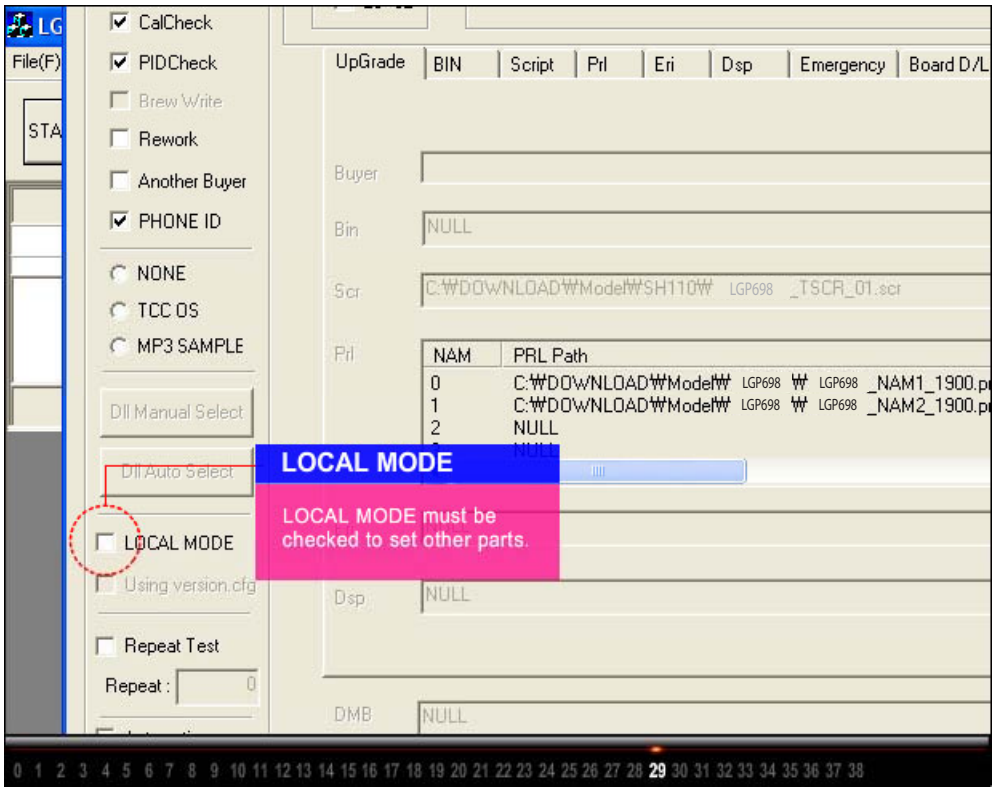


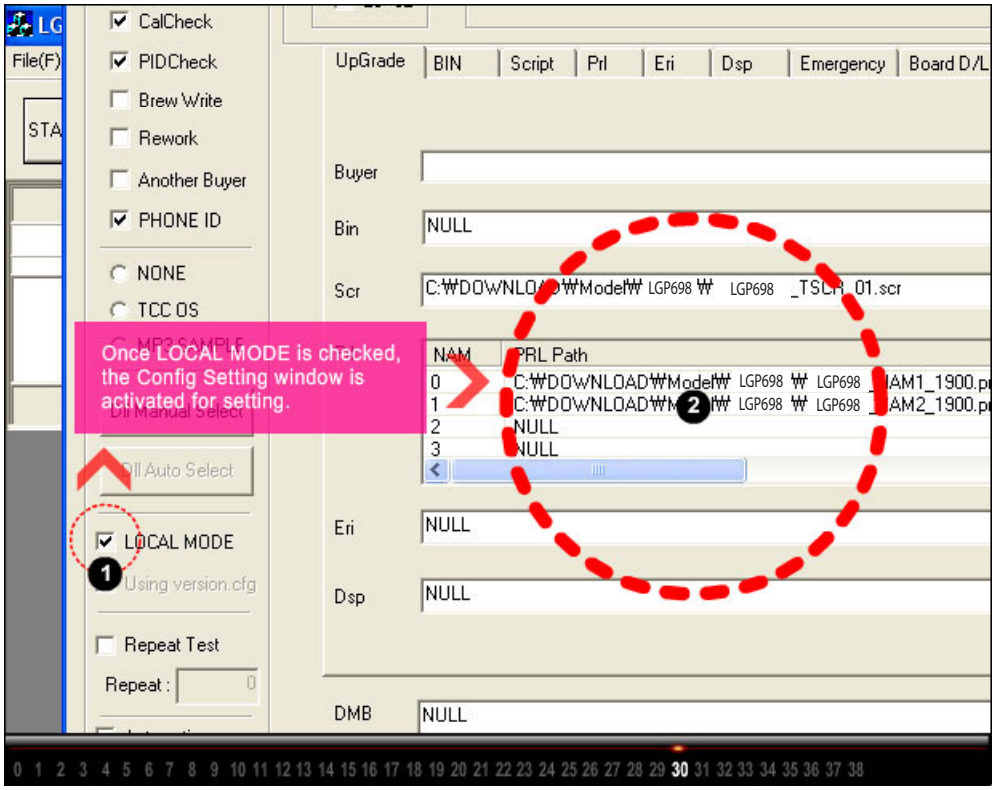


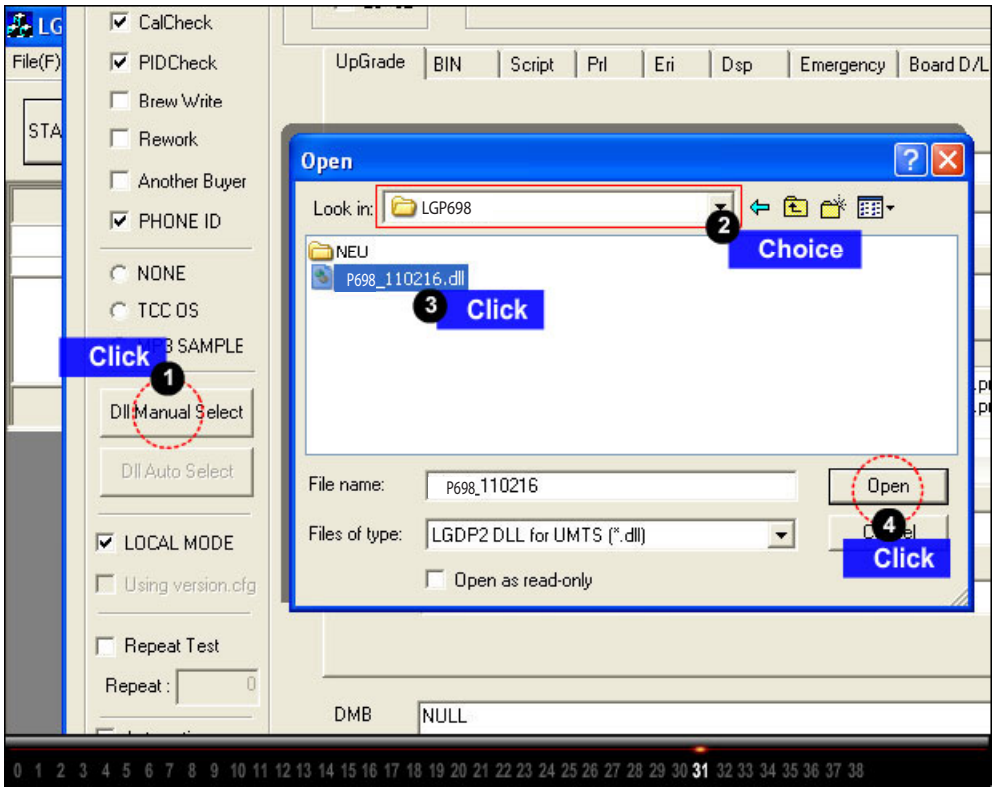


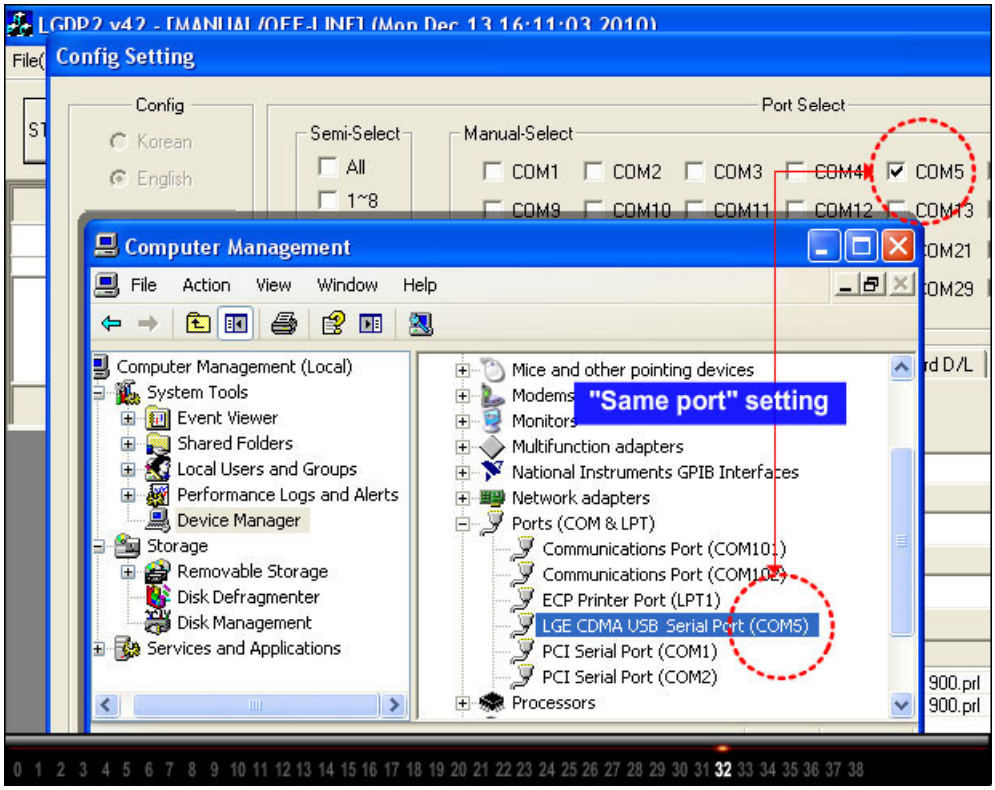


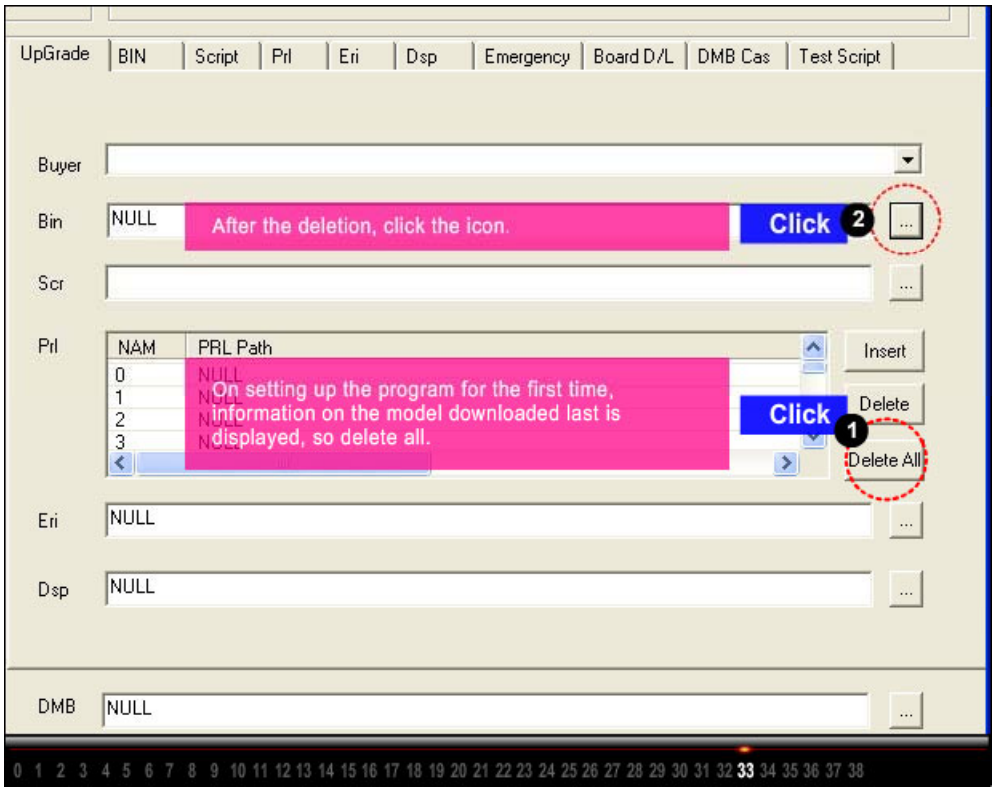


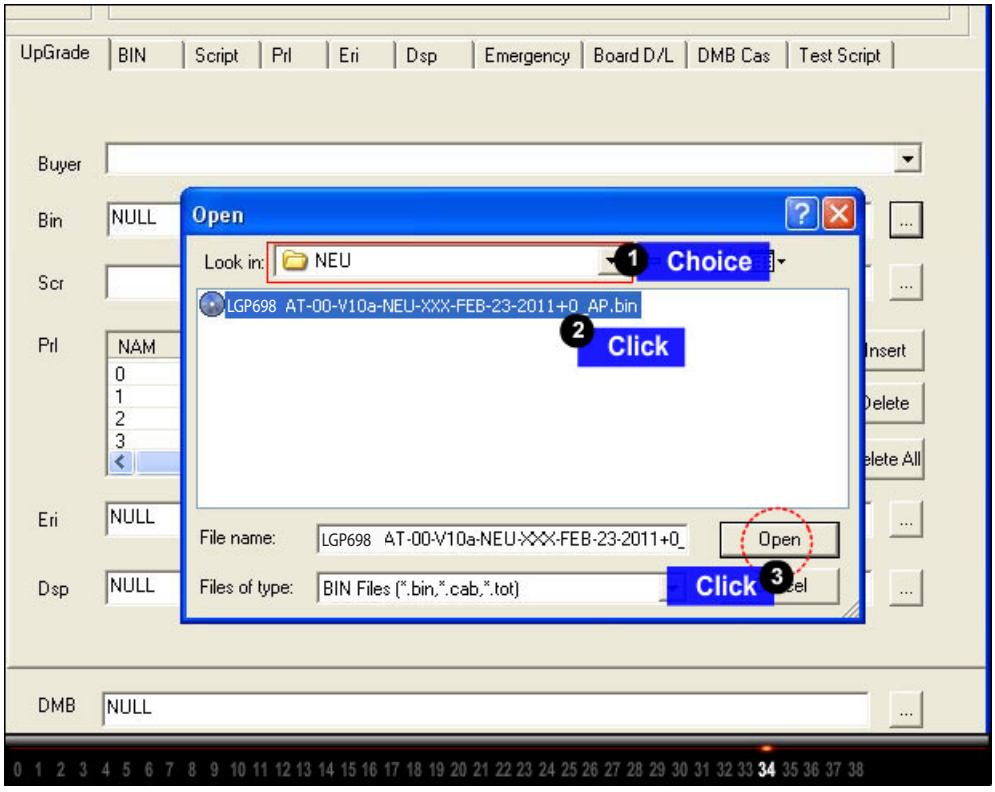


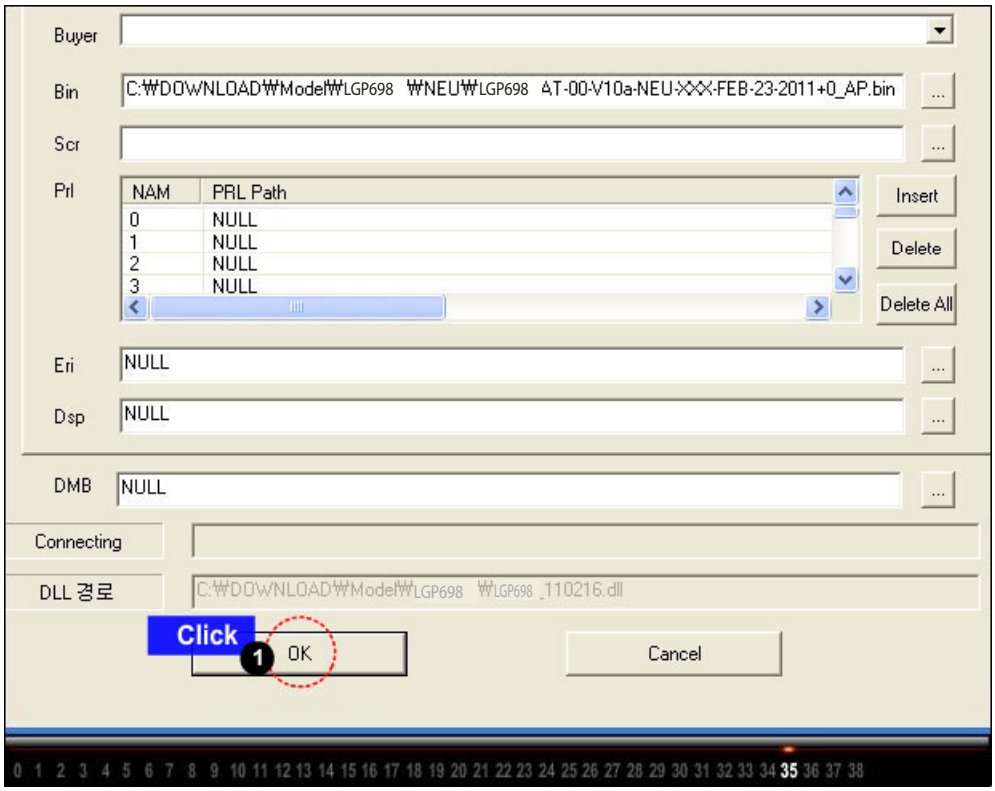


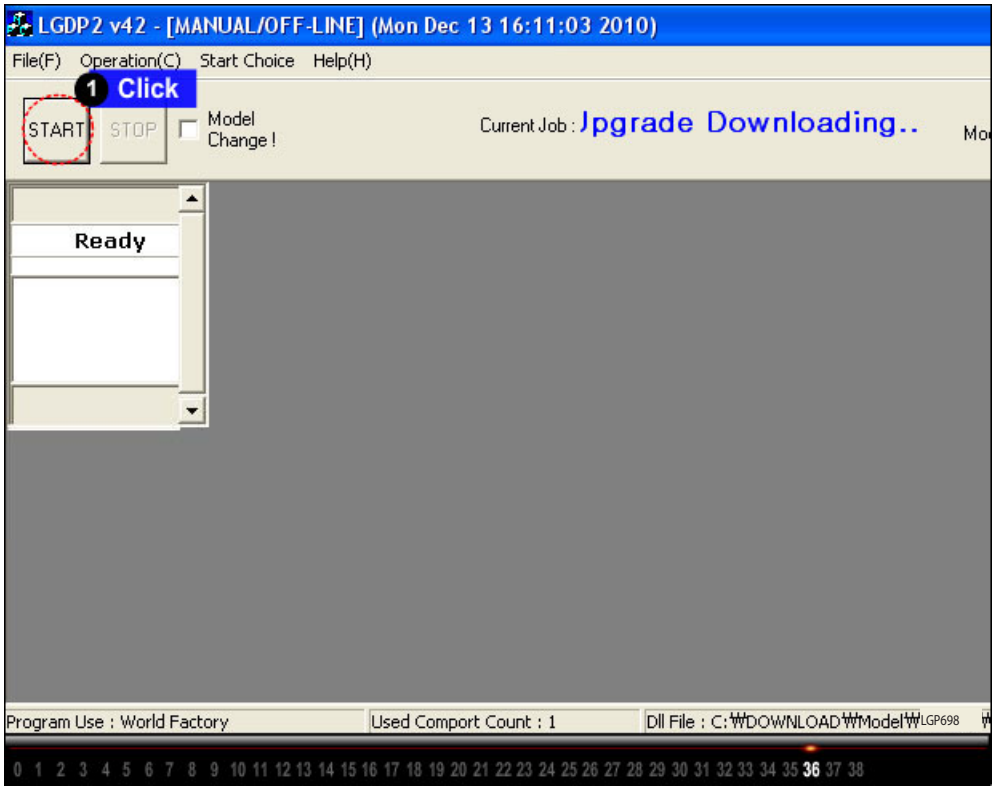


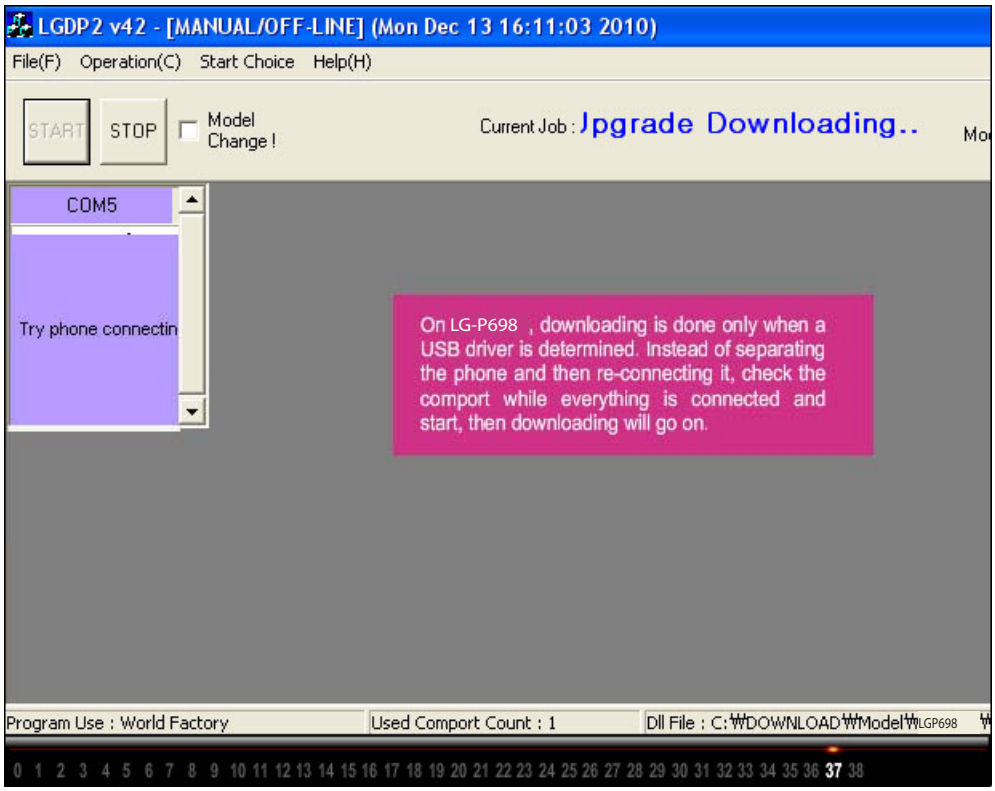


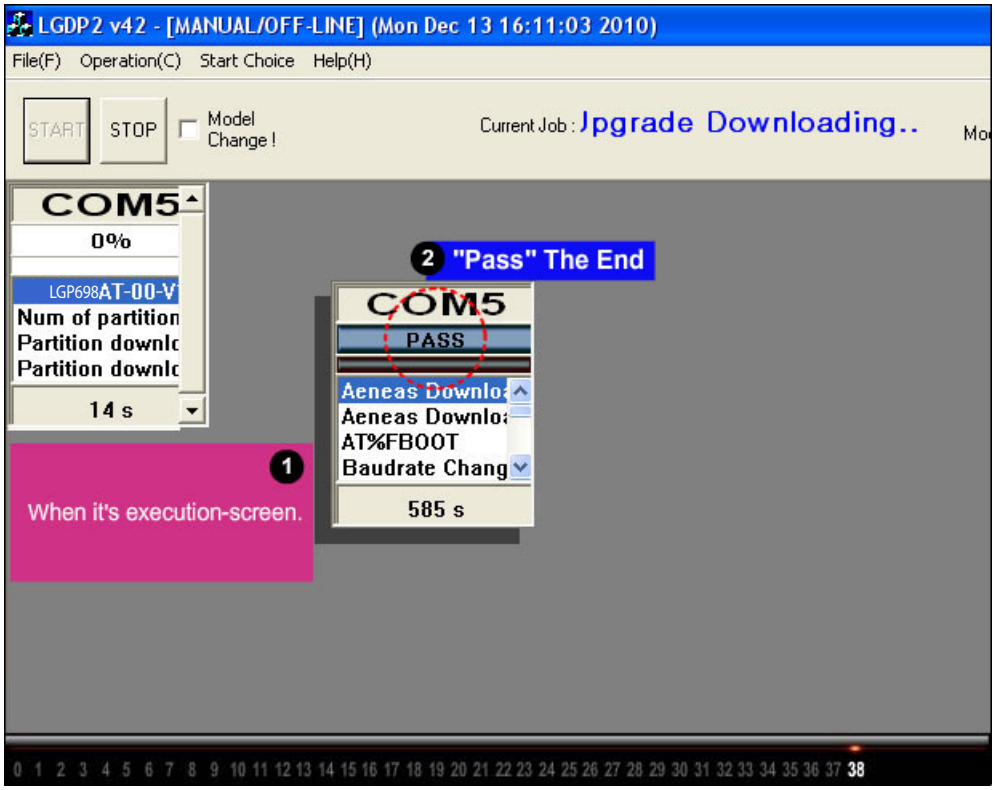






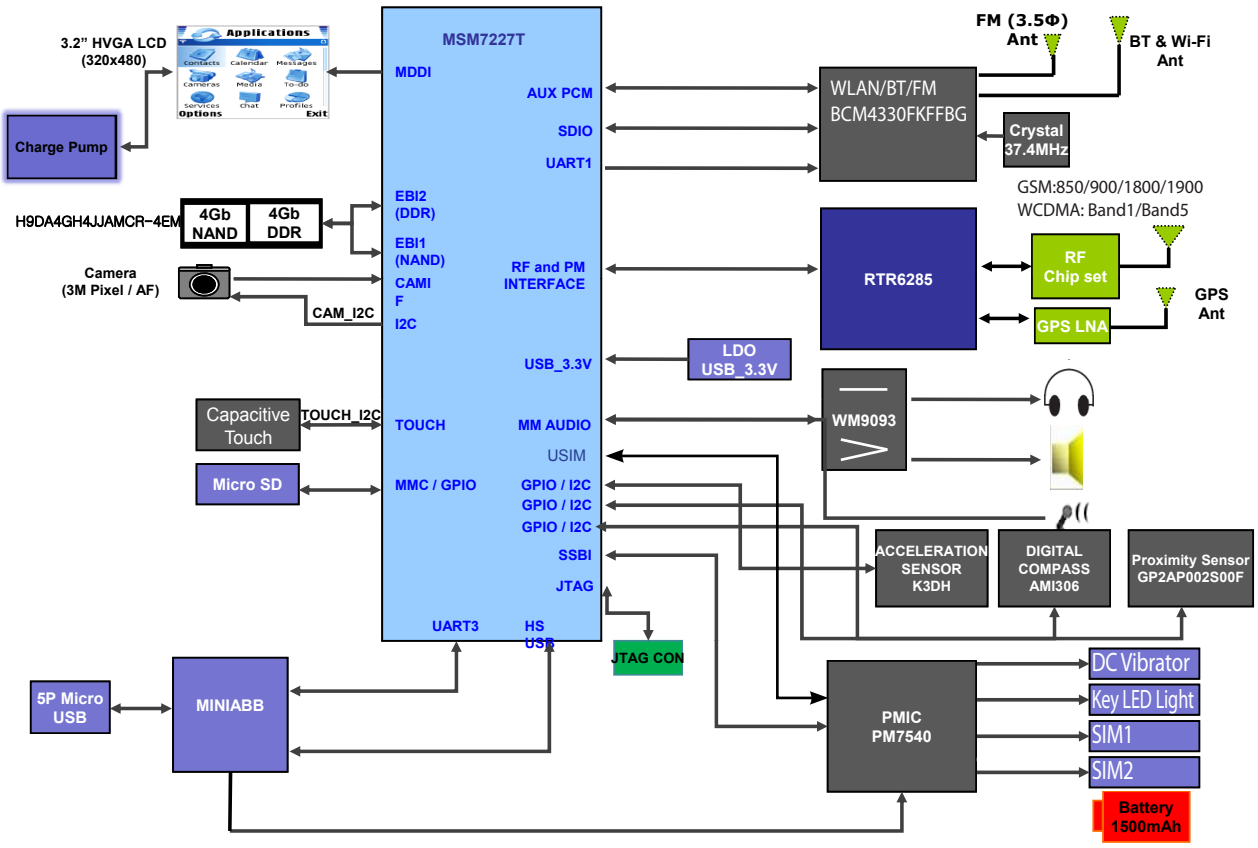




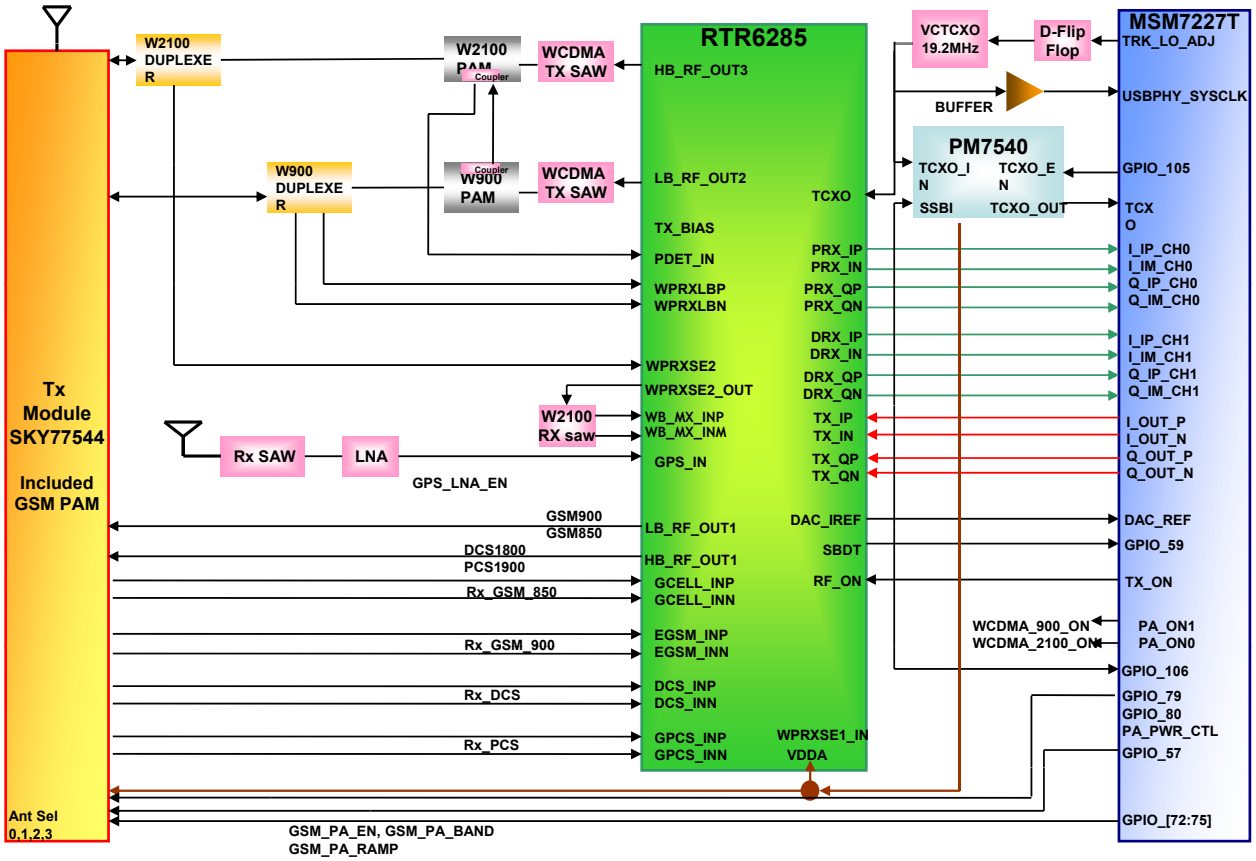


6.BLOCK DIAGRAM

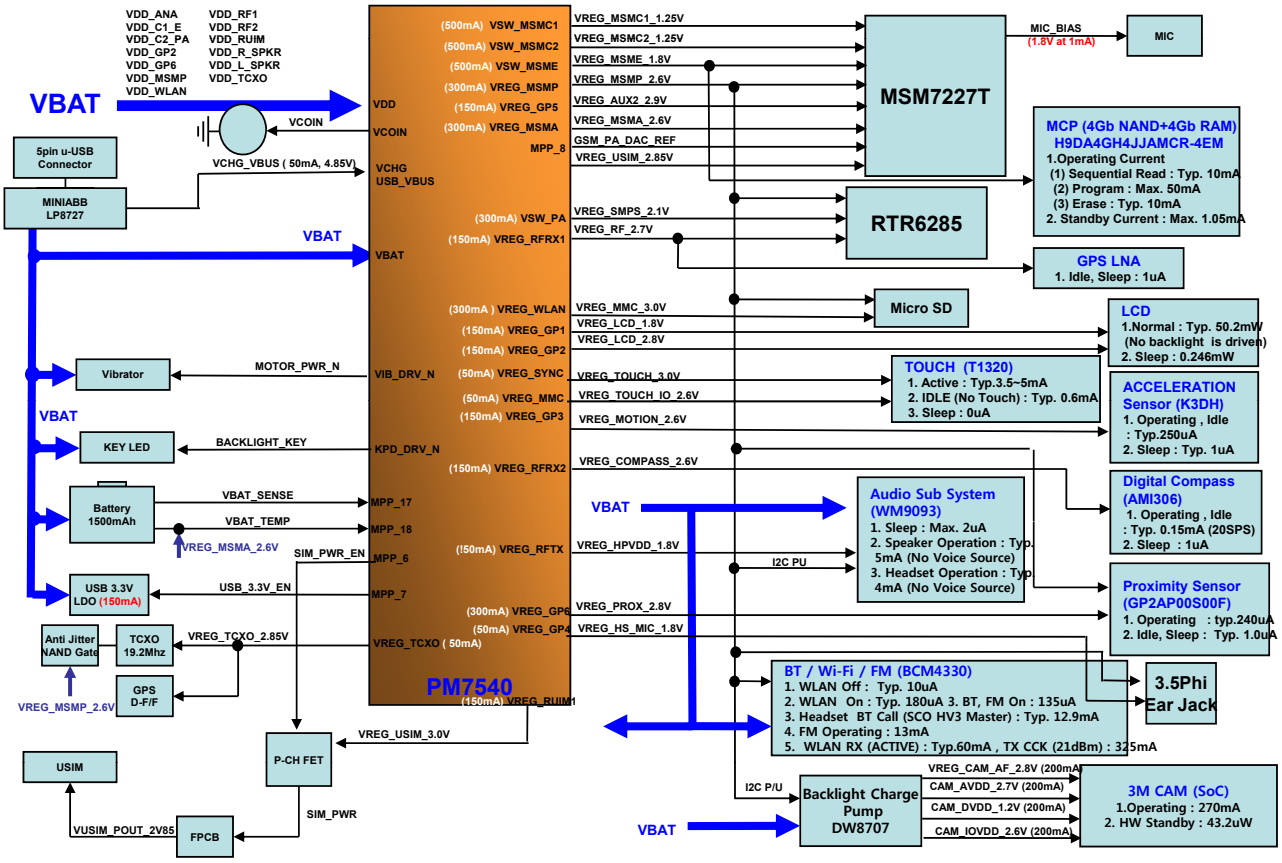
Gelato System Block Diagram



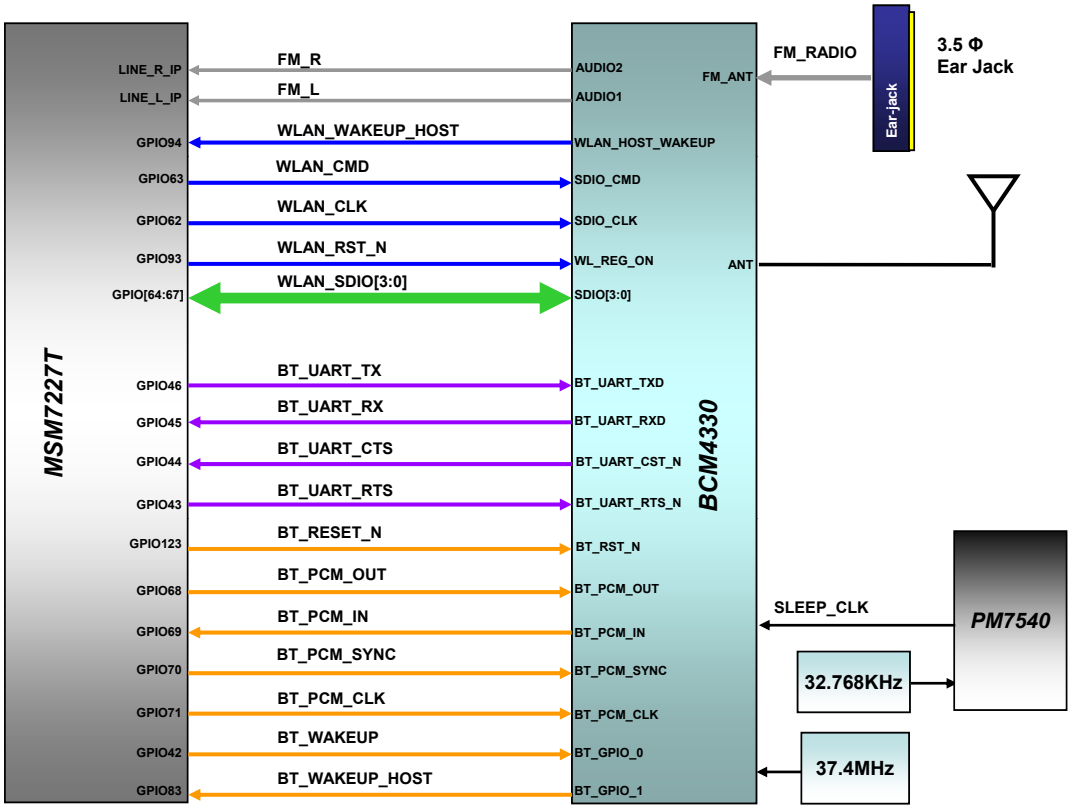
Gelato RF Block Diagram



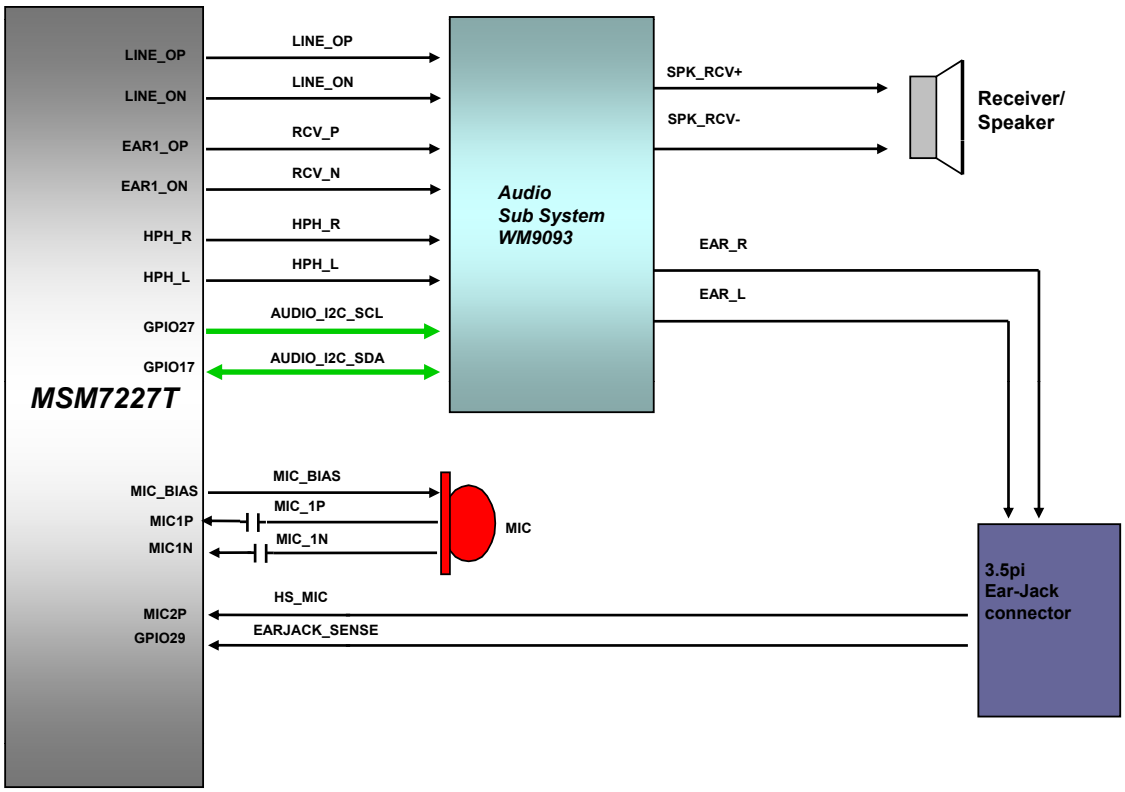
Gelato Block Diagram : Power



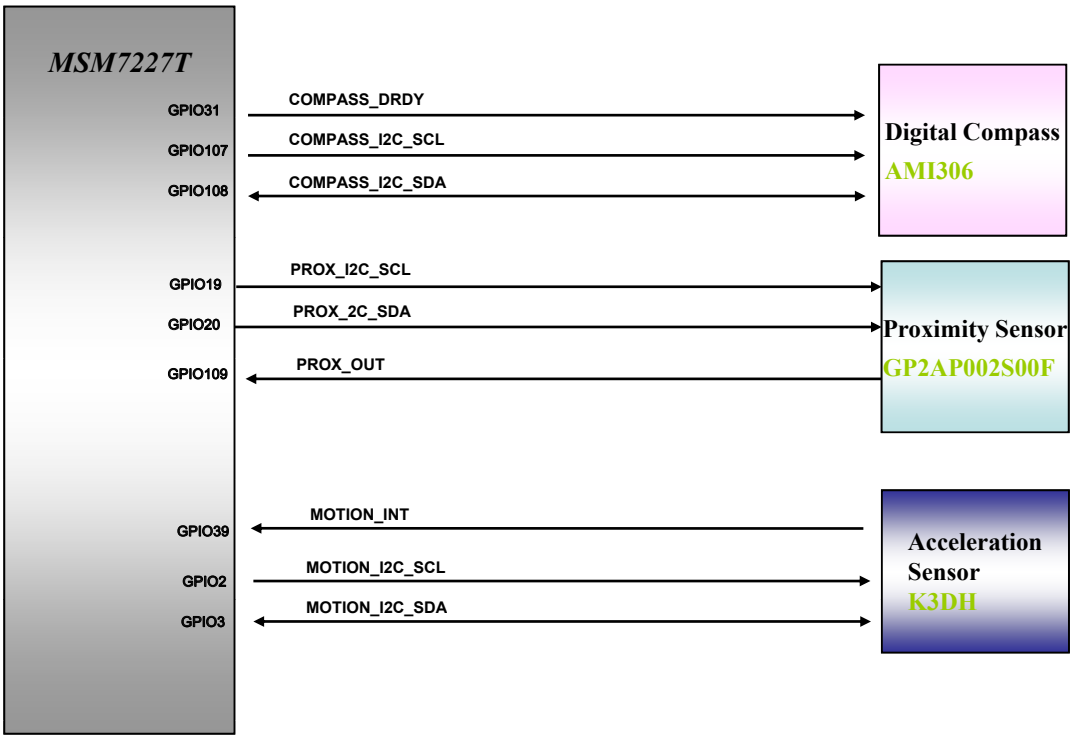
Gelato WLAN/BT/FM Interface



Gelato Audio Interface

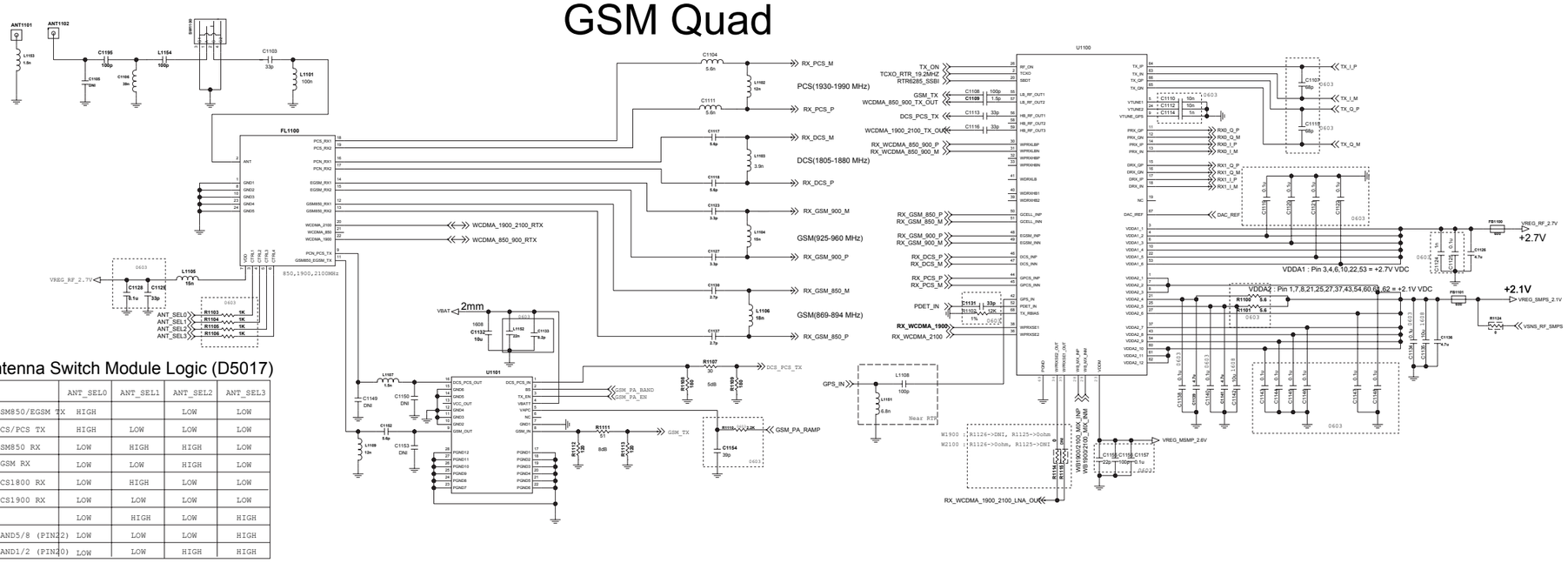


Gelato Sensor Interface



7. CIRCUIT DIAGRAM

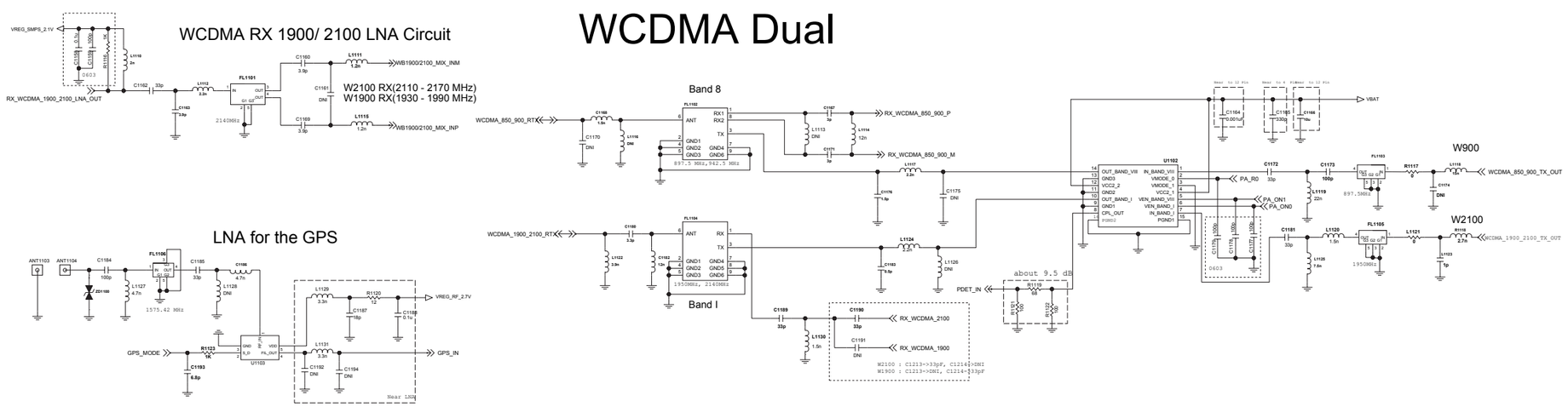
GSM Quad

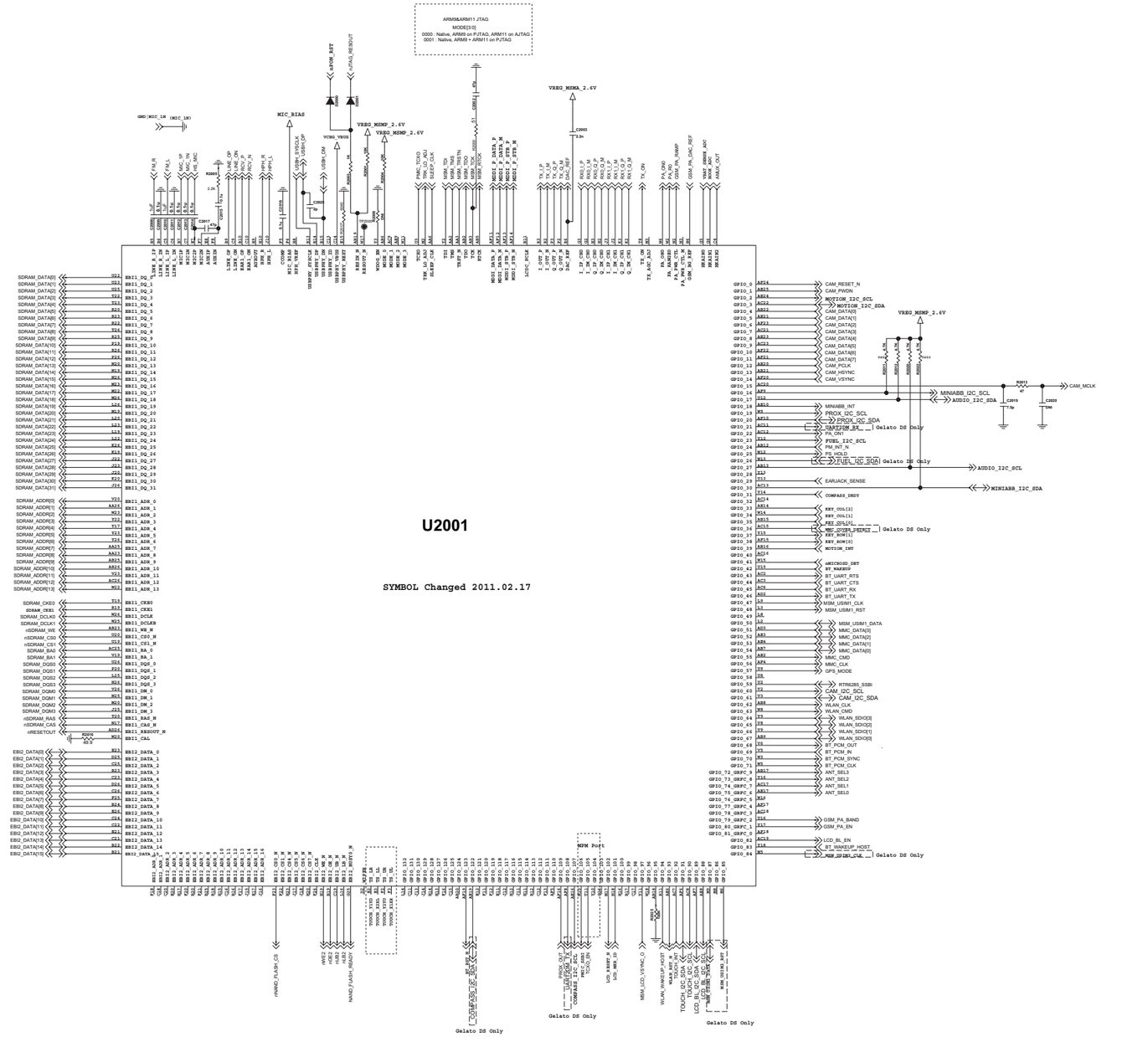


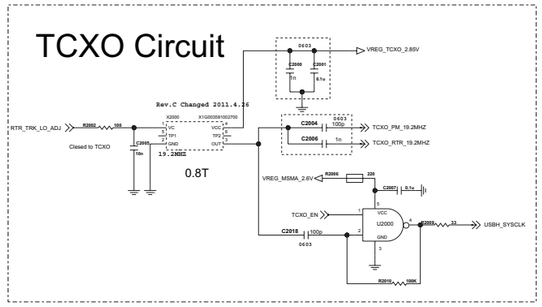
Antenna Switch Module Logic (D5017)

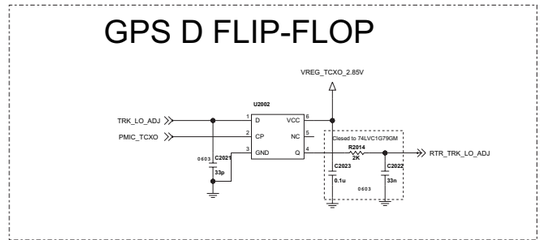
	ANT_SEL0	ANT_SEL1	ANT_SEL2	ANT_SEL3
GSM850/EGSM TX	HIGH		LOW	LOW
DCS/PCS TX	HIGH	LOW	LOW	LOW
GSM850 RX	LOW	HIGH	HIGH	LOW
EGSM RX	LOW	LOW	HIGH	LOW
DCS1800 RX	LOW	HIGH	LOW	LOW
PCS1900 RX	LOW	LOW	LOW	LOW
	LOW	HIGH	LOW	HIGH
BAND5/8 (PIN22)	LOW	LOW	LOW	HIGH
BAND1/2 (PIN20)	LOW	LOW	HIGH	HIGH

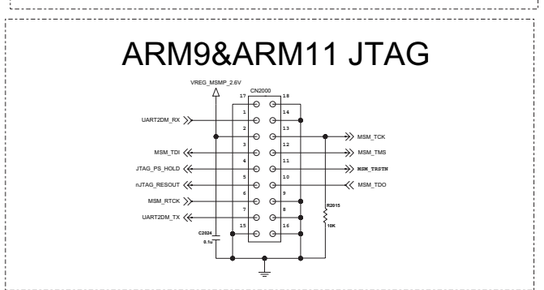
WCDMA Dual

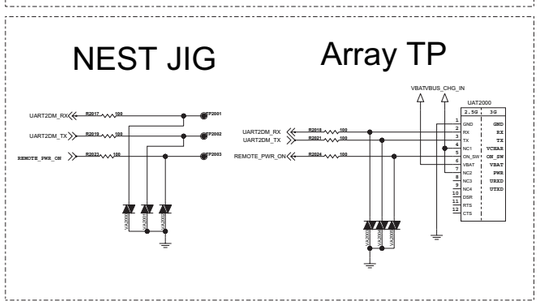




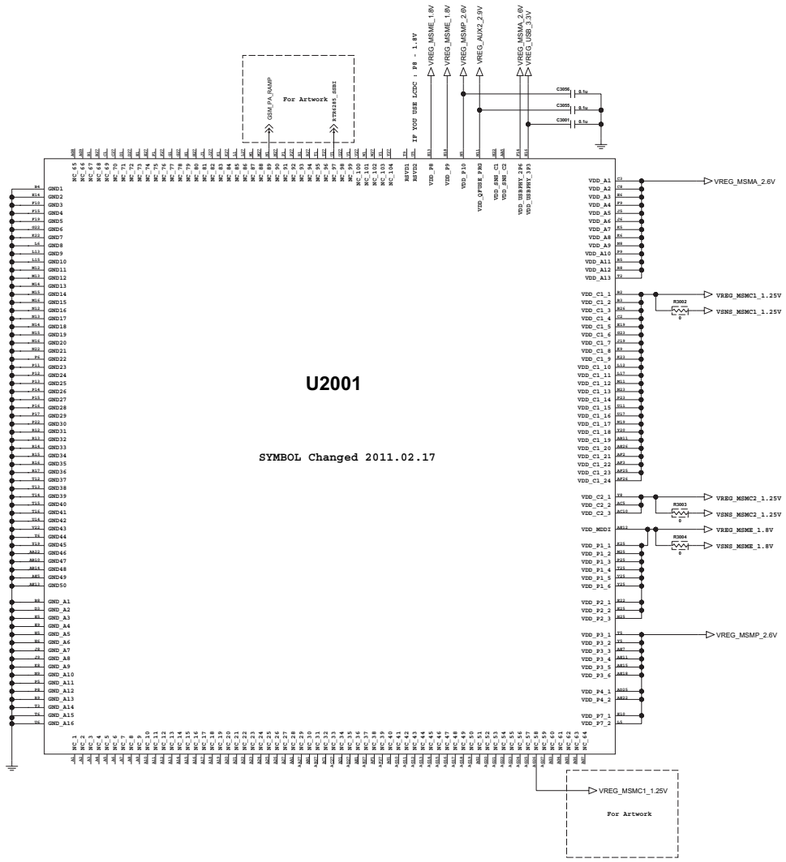




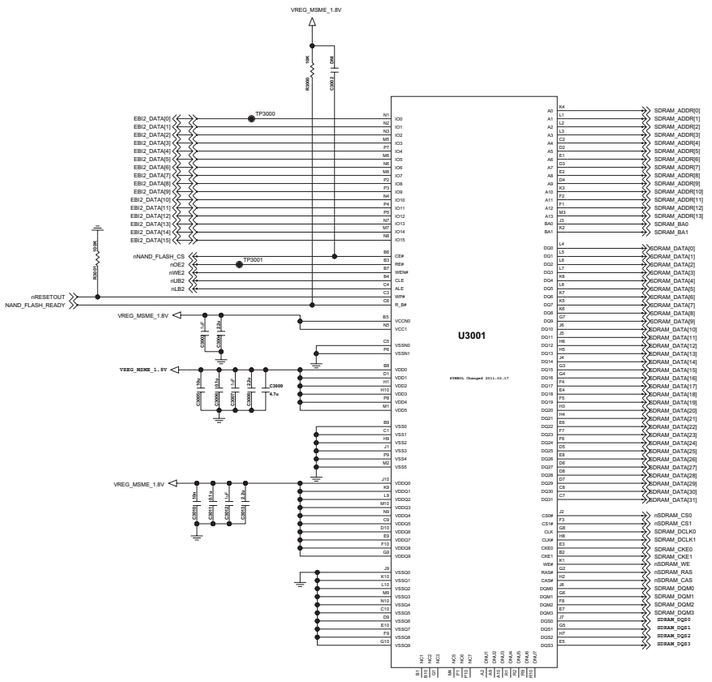




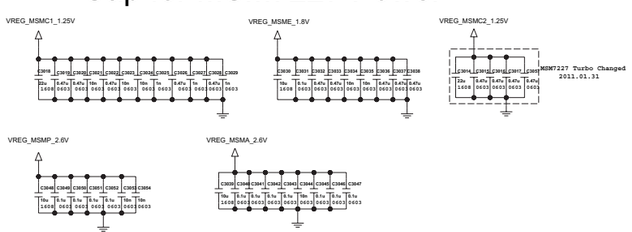
MSM7227 Power Part

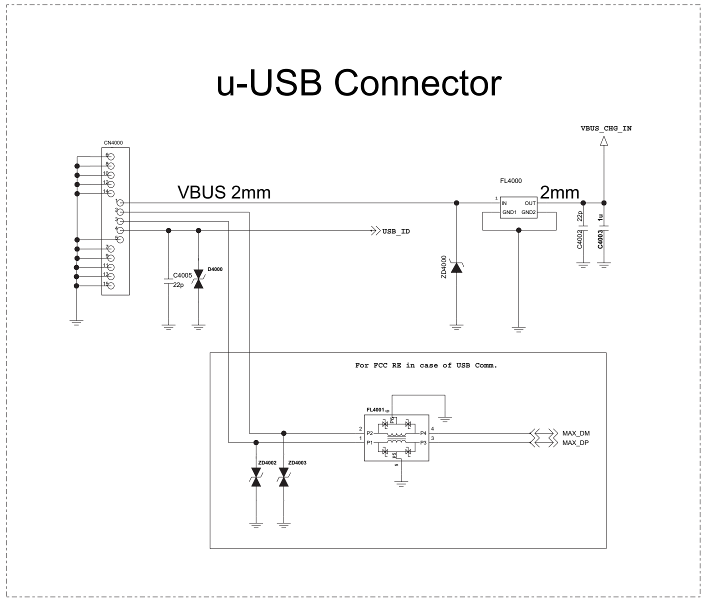


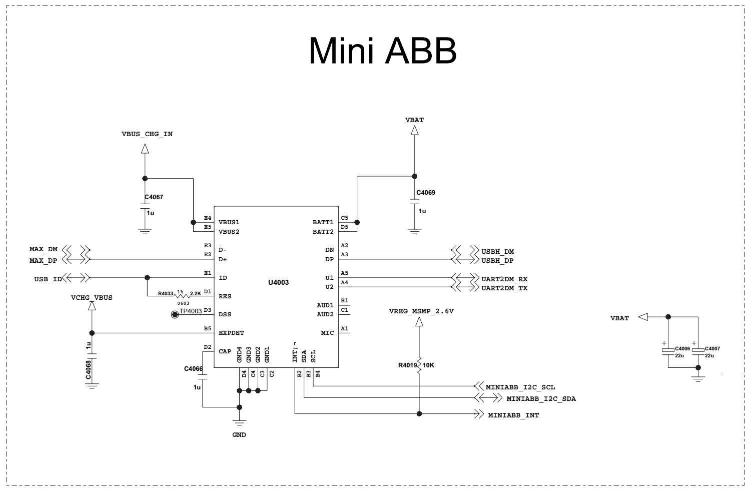
1'ST : HYNIX H9DA4GH4JJAMCR-4EM EAN61955301
2'ND : MICRON MT29C4G96MAZAPCJA-5IT EUSY0426801

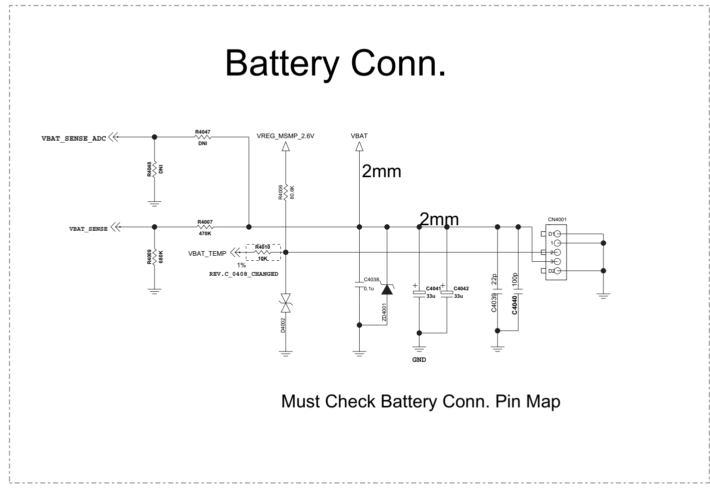


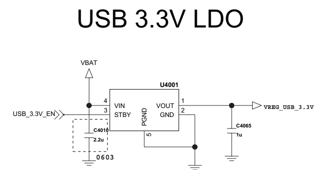
Cap for MSM7227 Power

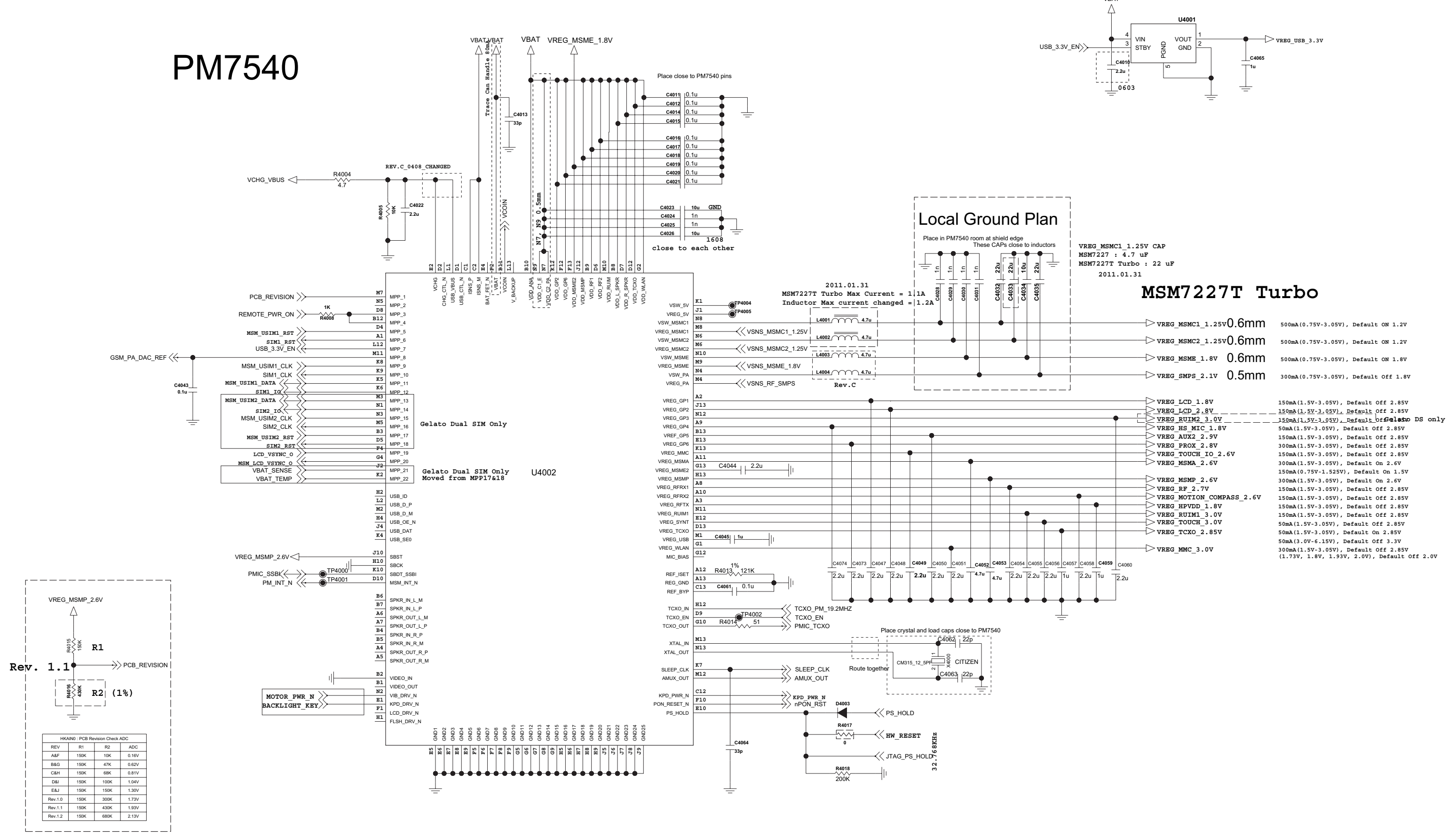


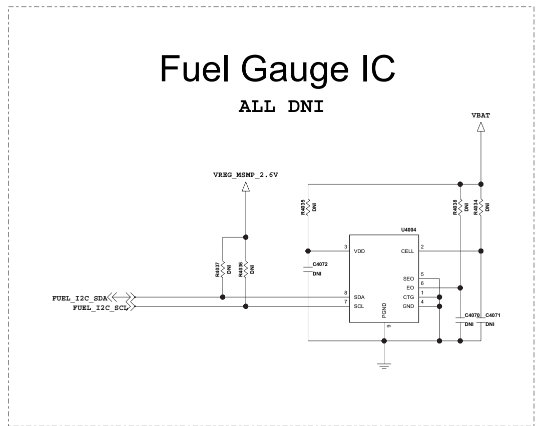




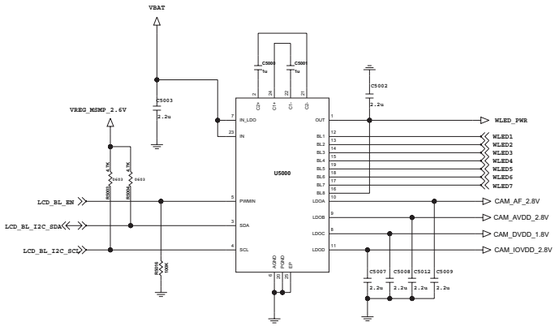






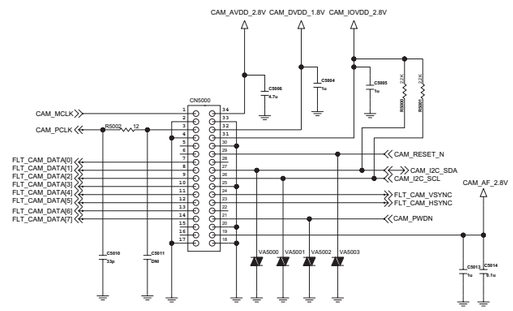


BACKLIGHT CHARGE PUMP

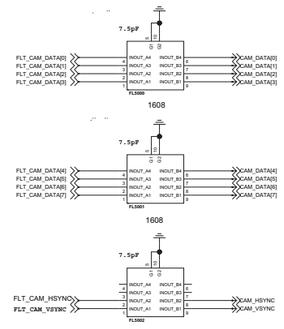


3M CAMERA

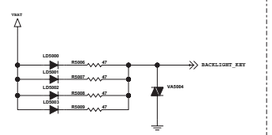
COWELL_1/5" EBP61342001(CW3028-AK5CA)



CAMERA EMI FILTER

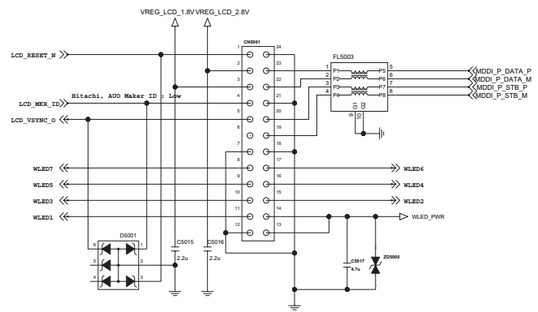


KEY BACKLIGHT LED

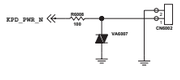


3.2" HVGA LCD Connector

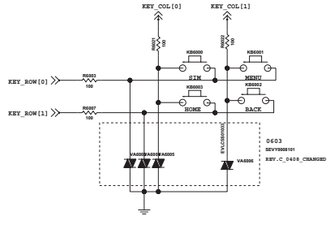
1'st Hitachi_3.2" SVLM0041401
2'nd AUO_3.2" EAJ61772101(H320QN01 V0)



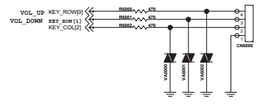
POWER KEY



HOT KEY

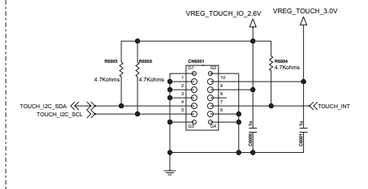


VOLUME SIDEKEY

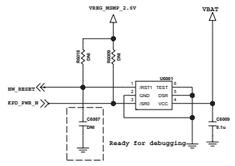


TOUCH

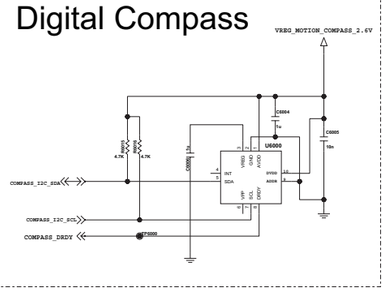
1'st YFO_ EBD61125601(H038)
2'nd Tovis



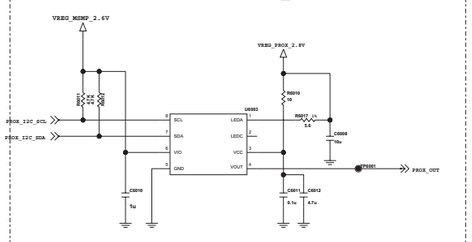
HW RESET IC



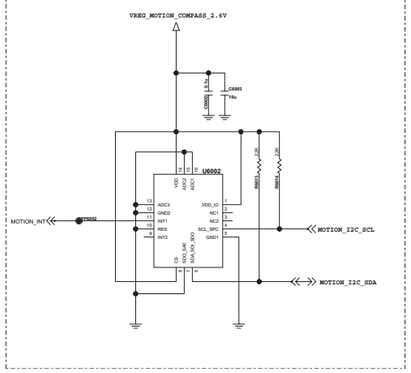
Digital Compass



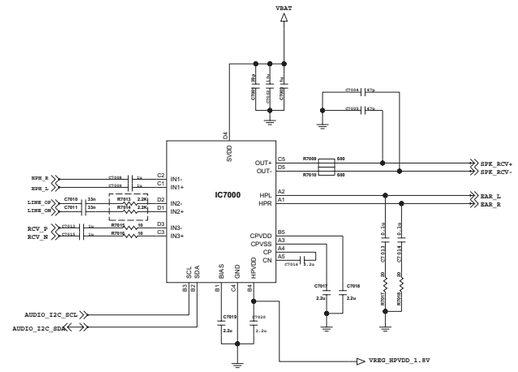
Proximity Sensor



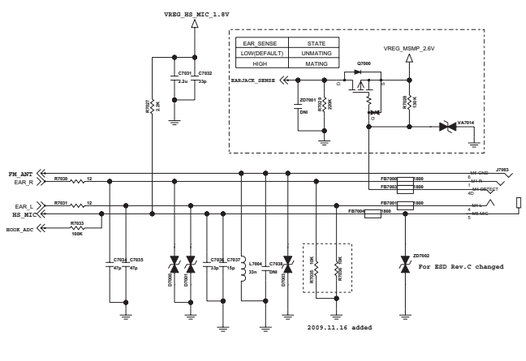
Acceleration Sensor



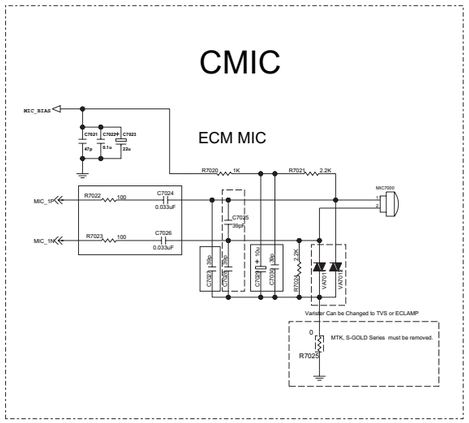
Audio SUB SYSTEM



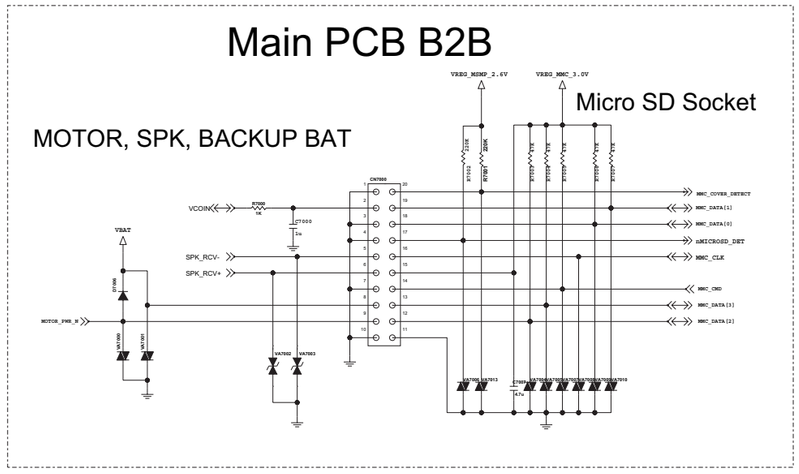
3.5pi Ear Jack Connector



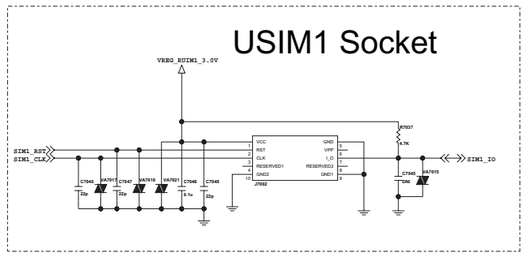
CMIC



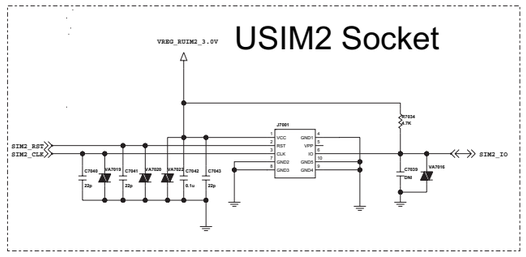
Main PCB B2B



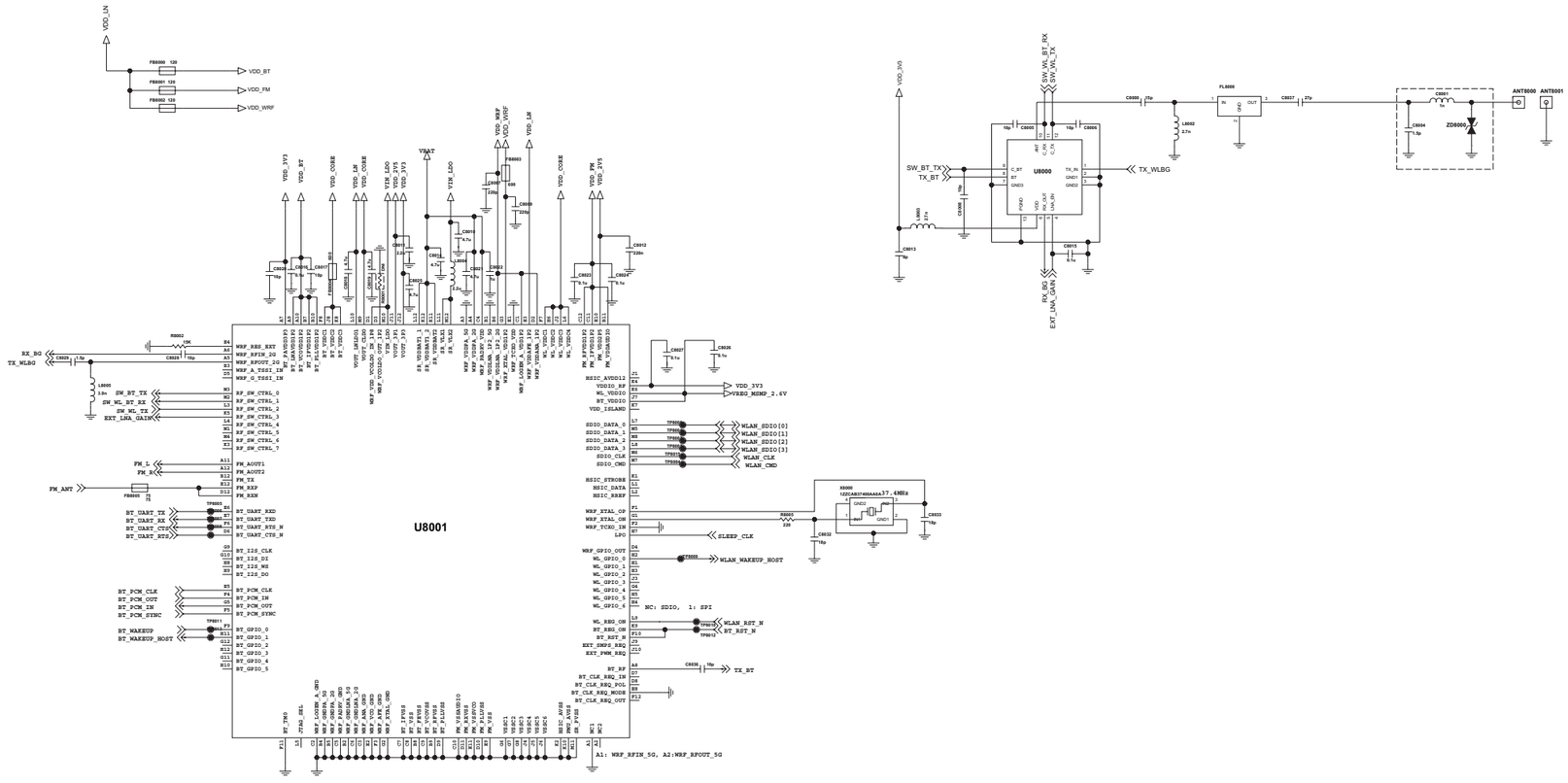
USIM1 Socket



USIM2 Socket



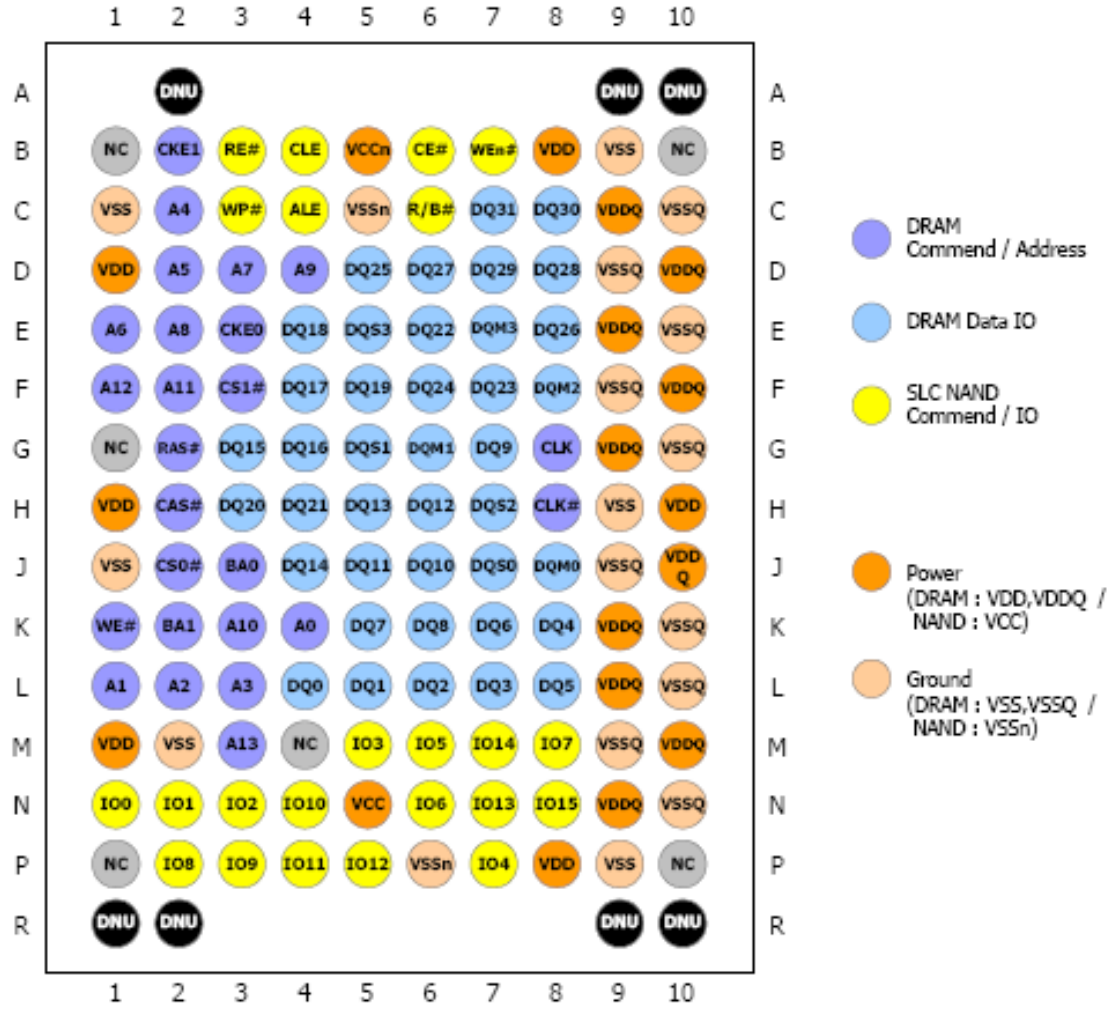
BCM4330_2.4GHz(QCT & IFX Only)_COB_With FM RX_Ver0.1



VBAT	QCT	VBAT
	IFX	VBAT
VBT_WIFI_IO_2V6	QCT	VREG_MSMP_2V6
	IFX	VPM_IO_2V62

8. BGA PIN MAP

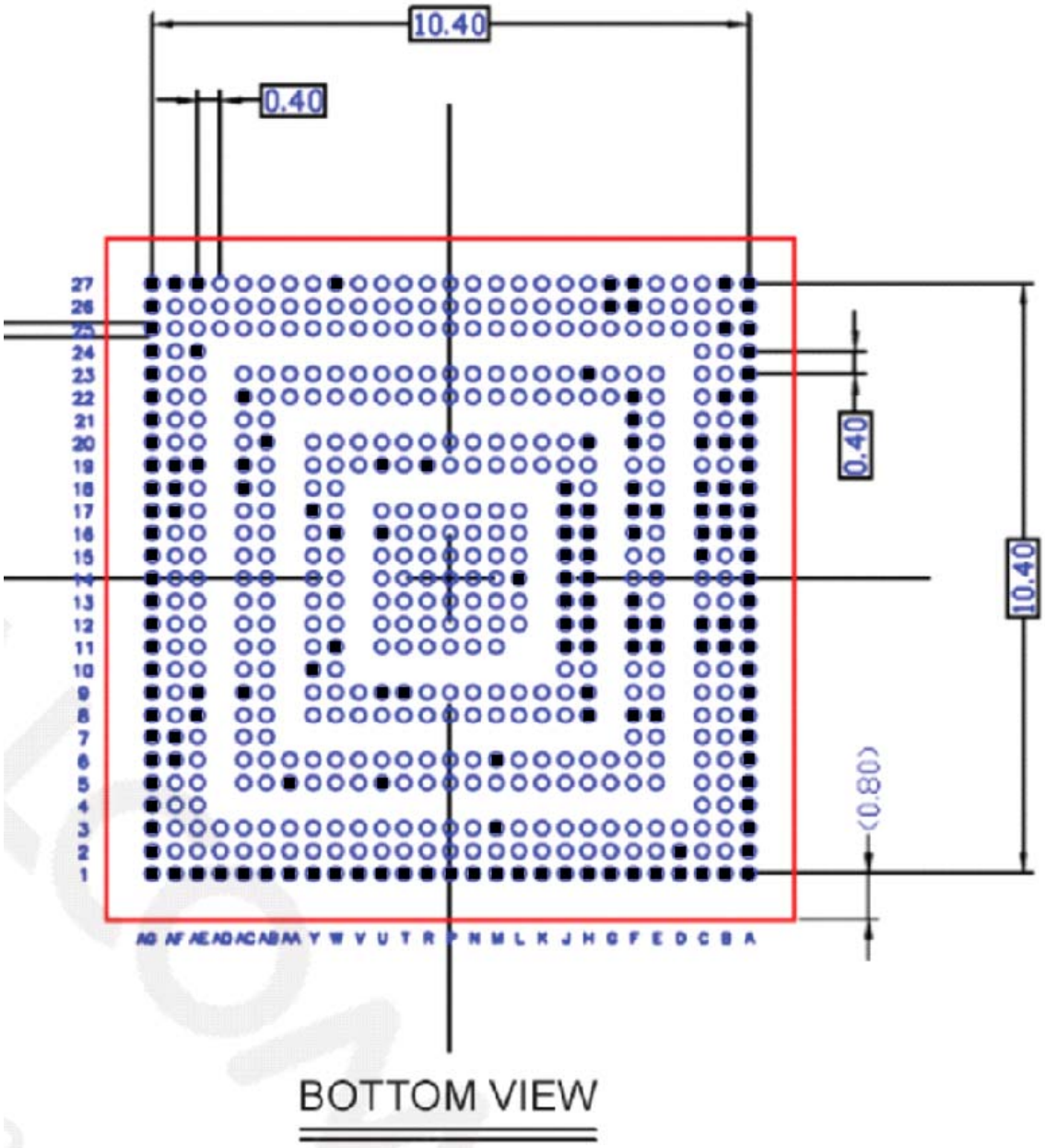
MCP



Top View

137ball 10.5x13 MCP (x16 SLC NAND + x32 LPDDR)

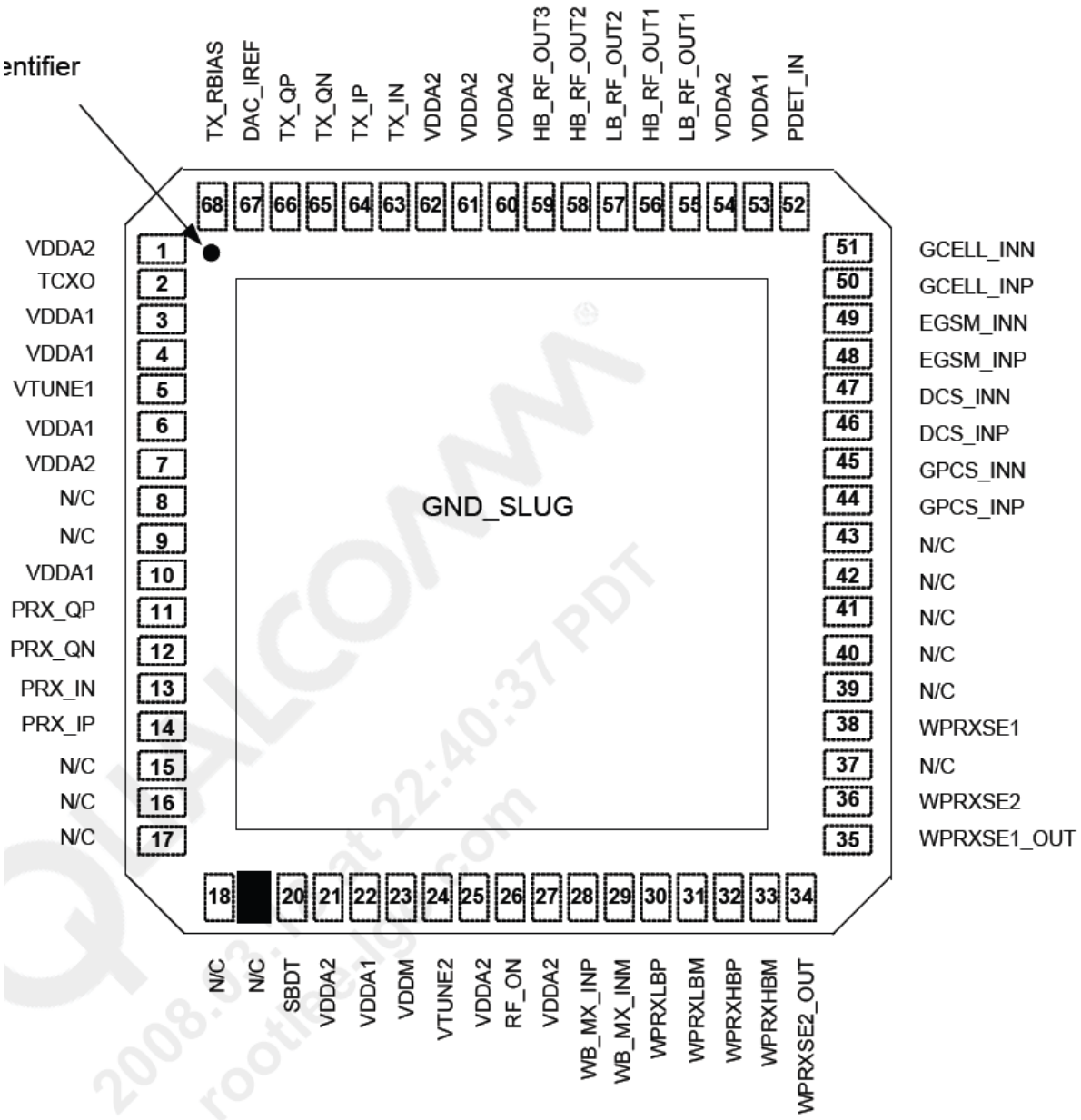
MSM7227T



○ USE

● NOT IN USE

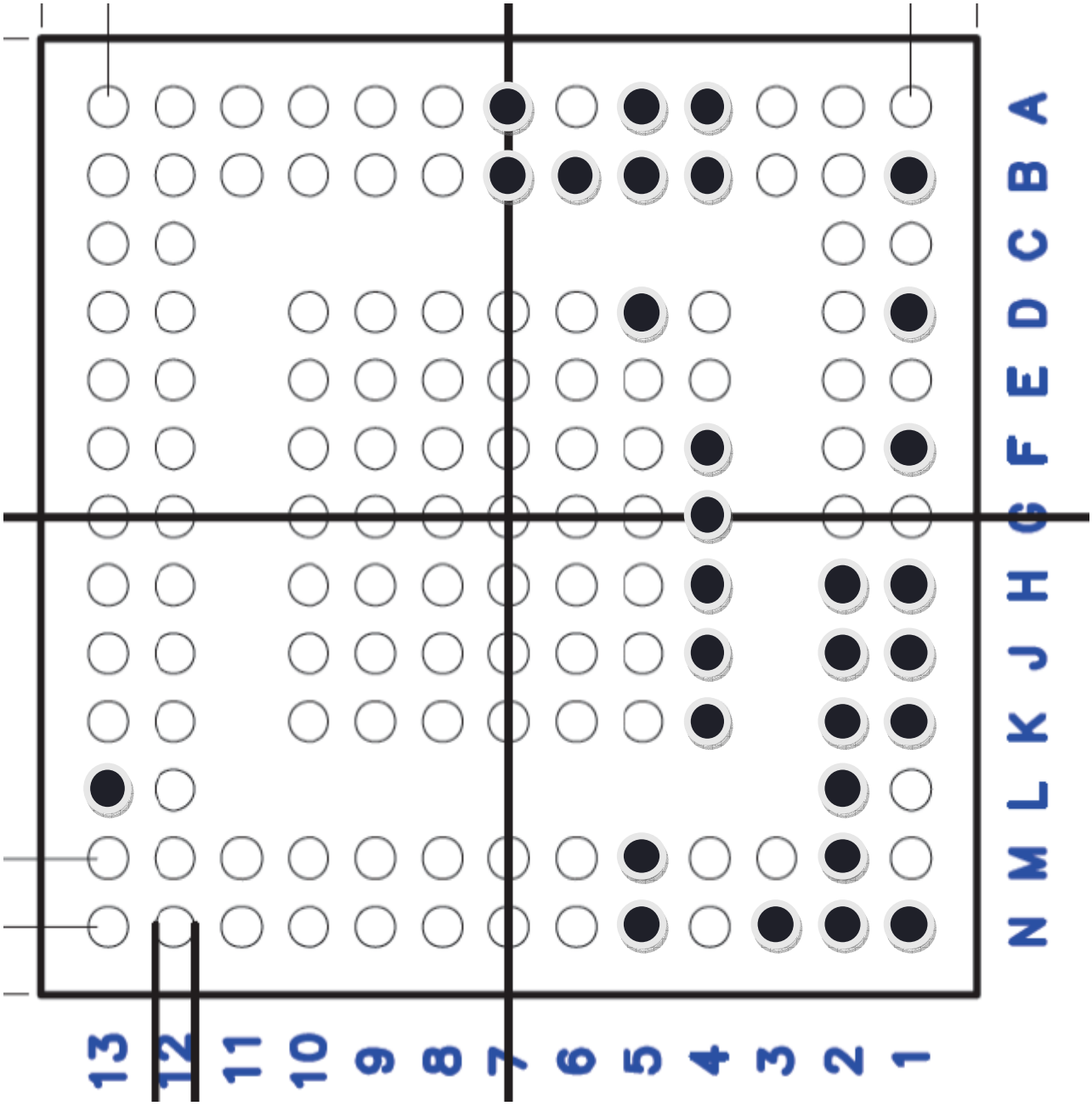
RTR6285(Top View)



○ USE

● NOT IN USE

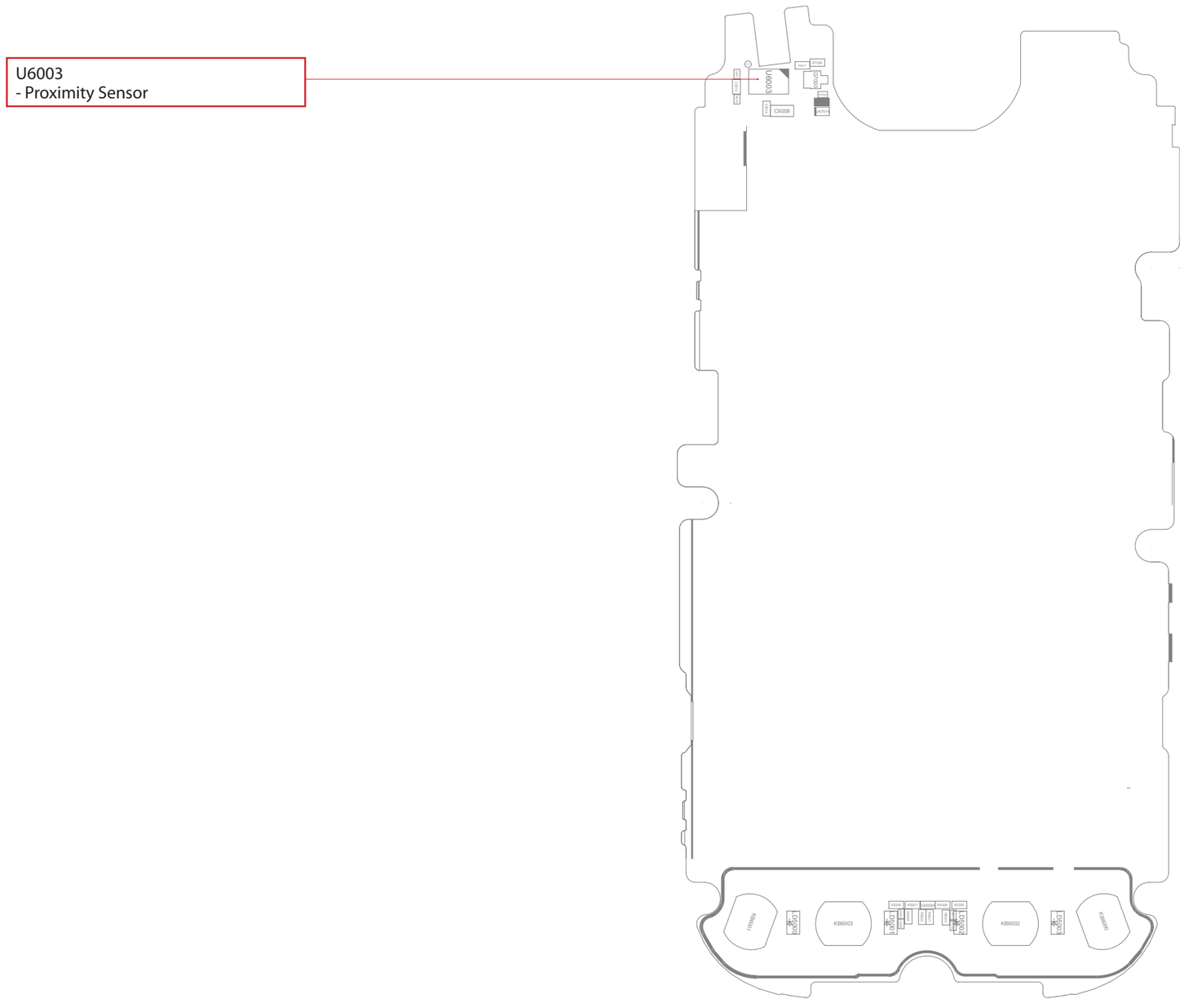
PM7540(PMIC)



○ USE

● NOT IN USE

9. PCB LAYOUT



LG-P698_MAIN_EAX64293901_1.1_TOP

CN6001 : Touch Connector
- no touch sensing

CN7000 :FPCB connector
- no sound
- no vibration
- no SD card

CN4000 : I/O connector
-no USB connection
-no Serial connection

U8001 : WIFI+BT+FM
- no BT connection
- no WIFI connection
- no FM Radio

U402 : PMIC
- no Booting
- no Power on
- no Service

U4002 : PMIC
-no Booting
-no Power on
-no Service

U2001 : DBB
- no Power on
- no Service

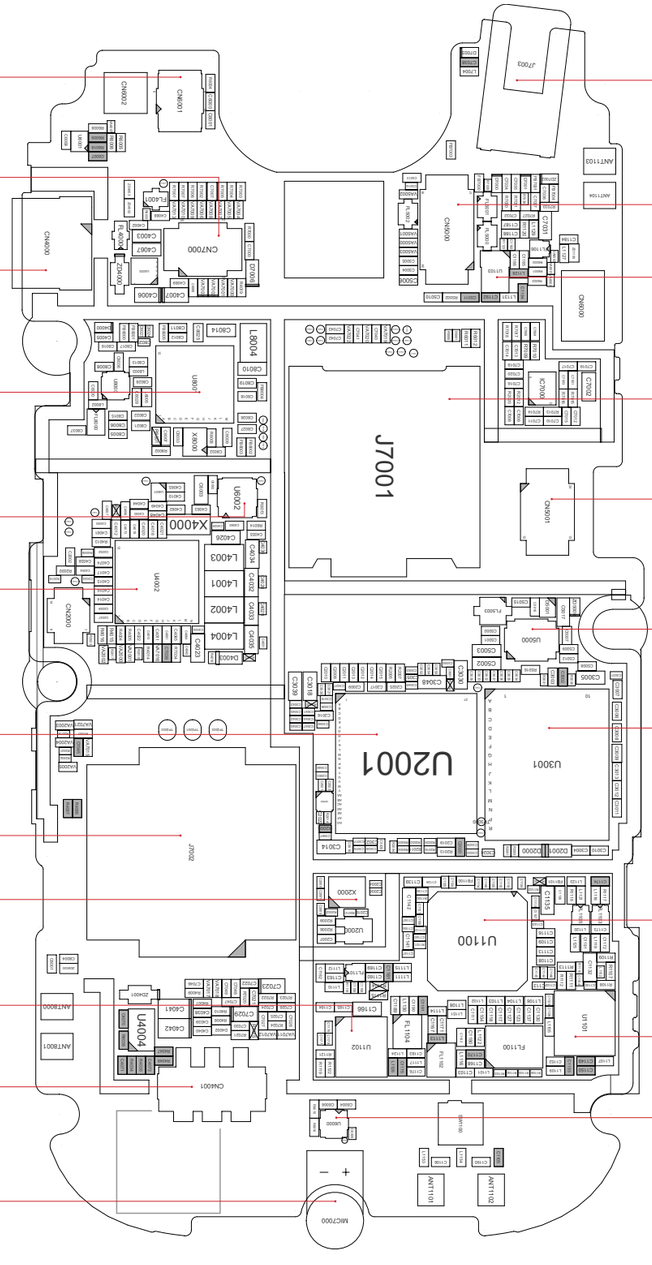
J7002 : SIM1 connector
- no SIM1

X2000 : 19.2MHz XTAL
- no Power on
- no Service

U1102 : WCDMA PAM
- no Service
- RF Tx Power

CN4001 : Battery Conn.
- no power on

MIC7000 : Microphone
- no far-end voice
- no voice recording



J7003 :3.5pi Ear-jack
- no sound

CN5000 :Camera connector
- no camera

U1103 : GPS LNA
- no GPS

J7001 : SIM2 connector
- no SIM2

U5000 : LCD charge pump
- no display backlight

U3001 : Memory
- no Booting

U1100 : RF Tranceiver
- no Service
- RF Sensitivity & Tx Power

U1100 : RF Tranceiver
- no Service
- RF Sensitivity & Tx Power

U1101 : GSM PAM
- no Service
- RF Tx Power

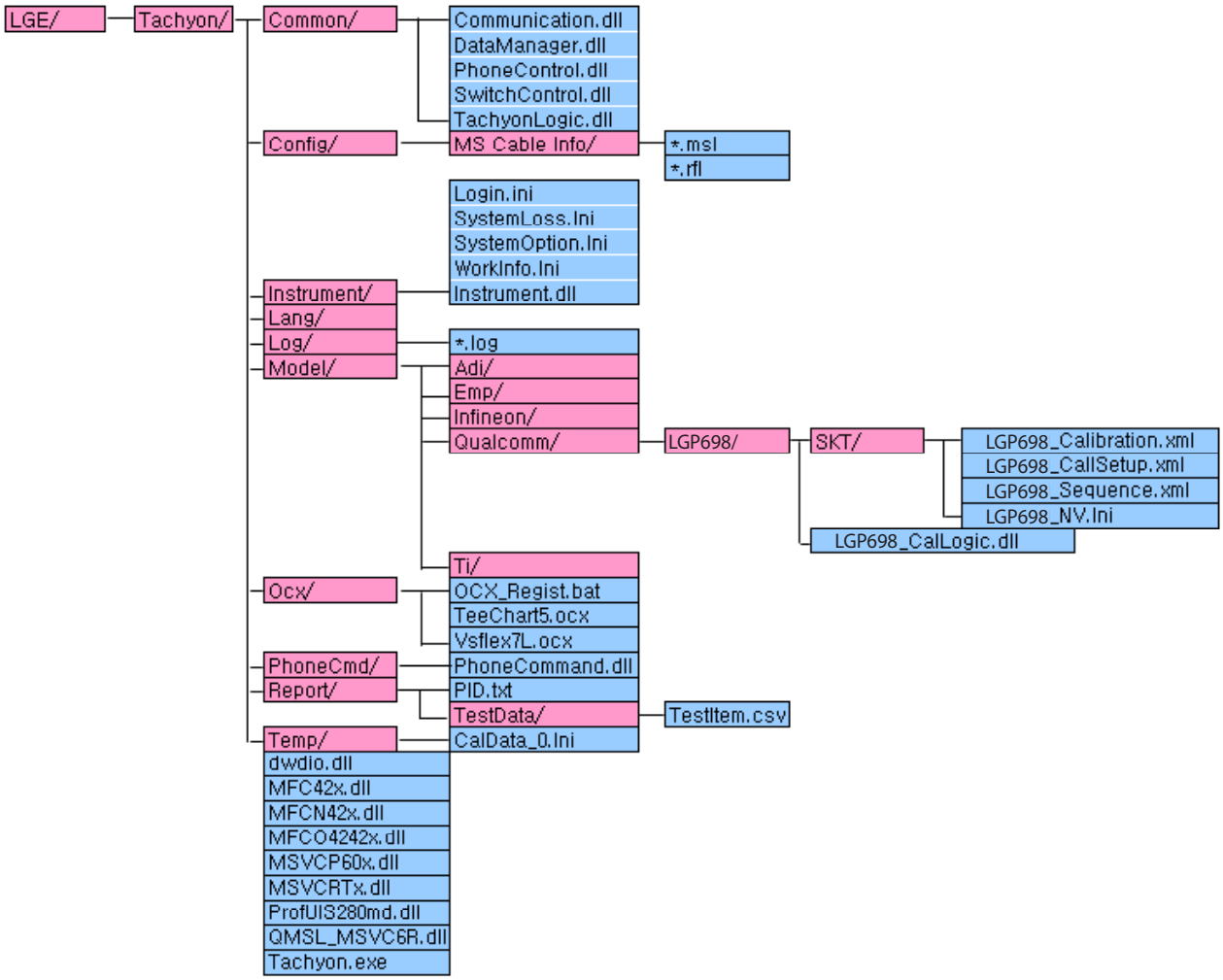
U6000 : Digital compass
- no compass

LGP698_MAIN_EAX64293901-1.1-BOT

10. CALIBRATION

10.1 Configuration of Tachyon

10.1.1 Configuration of directory



10.1.2 Description of basic folders

Folder	Description
Tachyon	Exe file and MFC dll, UI dll is present.
Common	Common dll files. (XML Data I/O , Auto Test Logic, Tachyon Logic Control, Communication)
Config	Envirement files. (Port configuration, Loss adjust)
Instrument	Tester control dll.
Model	Model files is present. (Model -> Solution (Qualcomm, EMP, ADI, INFINEON) -> MODEL NAME(LGGW620, LGSH470, ..) -> BUYER NAME(SKT, TEL, VIVO, …)
OCX	Conponent files.
PhoneCmd	Phone communication file
Report	Report Files is present. (Cal data, test data)

10.1.3 Description of configuration files

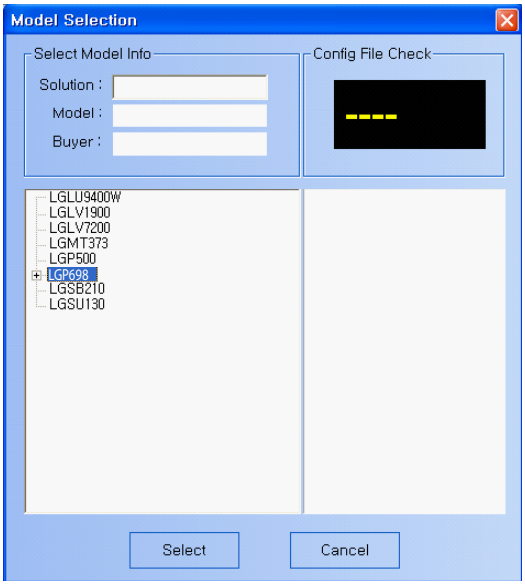
File	Description
'MODEL NAME'_Calibration.XML	There are imformations to calibrate. It consist of calibration items.
'MODEL NAME'_CallSetup.XML	There are imformations to call.
'MODEL NAME'_NV.INI	It consists of default values. It is written when 'cal&auto' is begun.
'MODEL NAME'_Sequence.XML	It is described a testing procedures.

10.2 How to use Tachyon

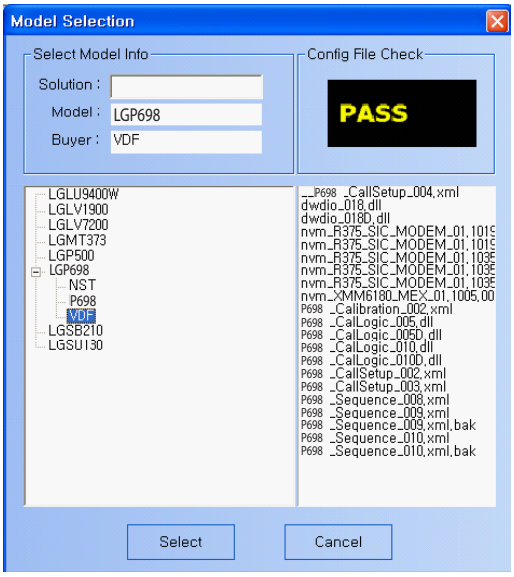
10.2.1 Model selection

Follow the procedure before start calibration & auto test

a. Click the icon,  in tool bar. Then, you can see the below screen.



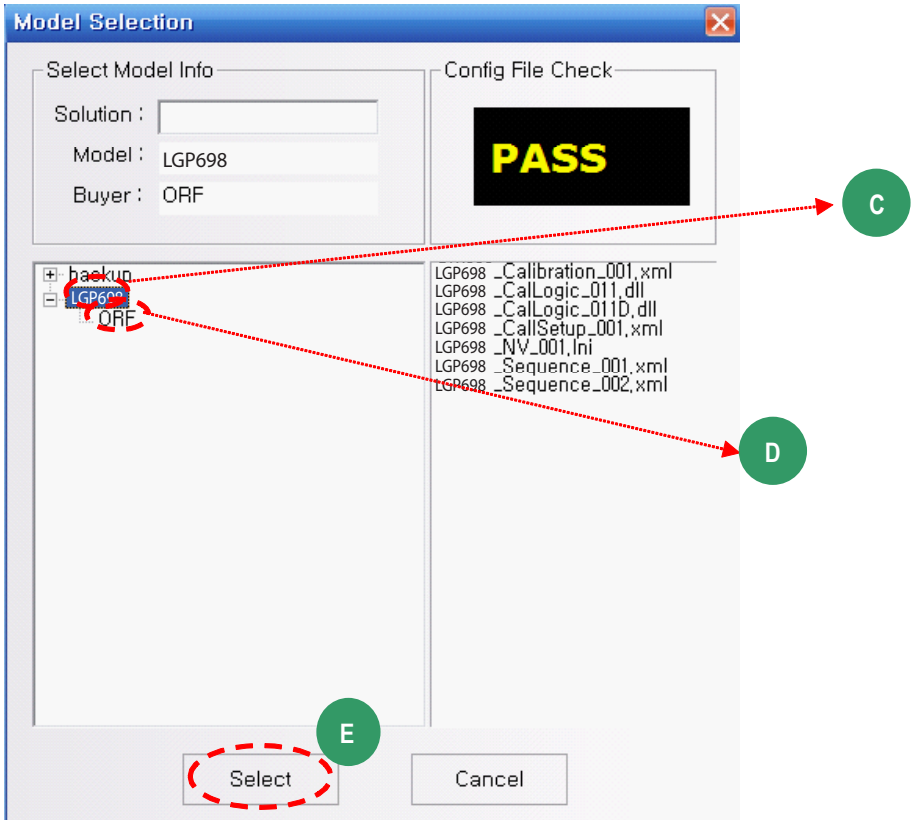
b. Select Model "LGP698"



c. Select the model : You should select "LGP698"

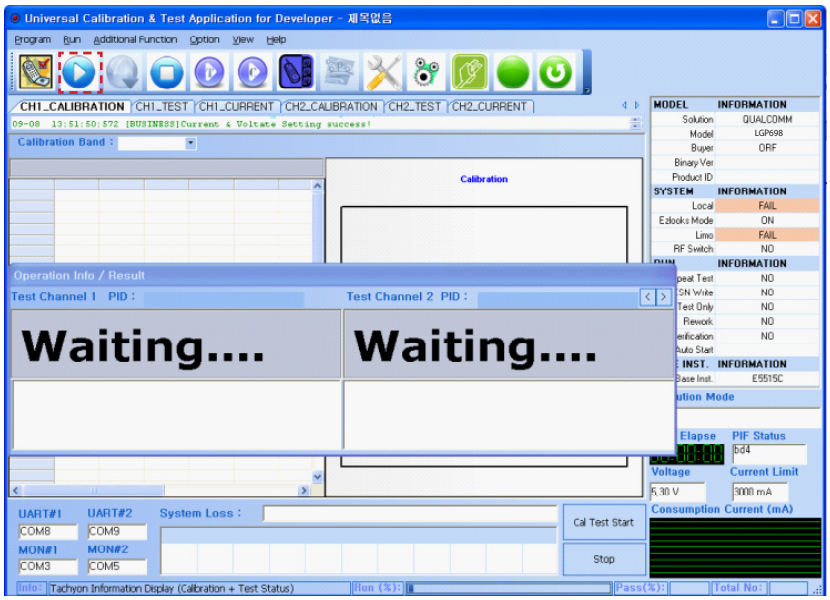
d. Select the buyer (must be double clicked) Then, you can see "PASS" in Config File Check.

e. Click select button



10.2.2 Start cal & auto

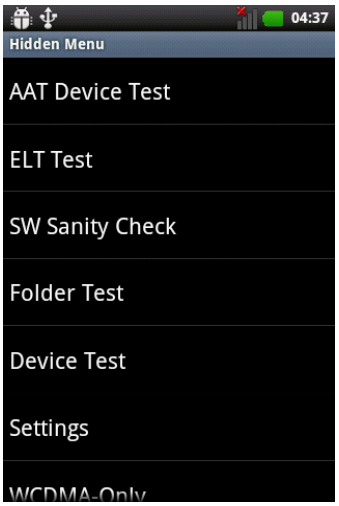
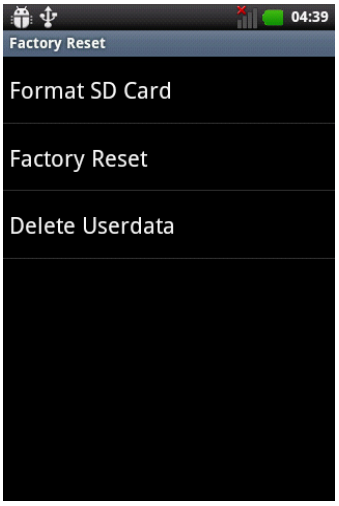
a. Click calibration & autotest button,  in Tool bar.

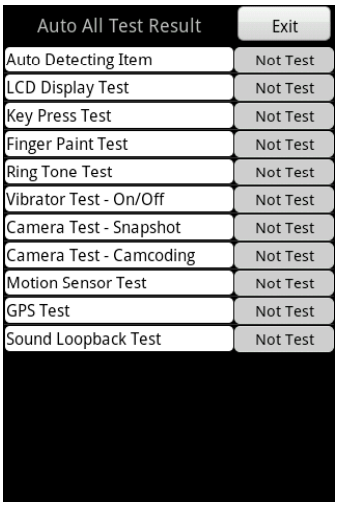
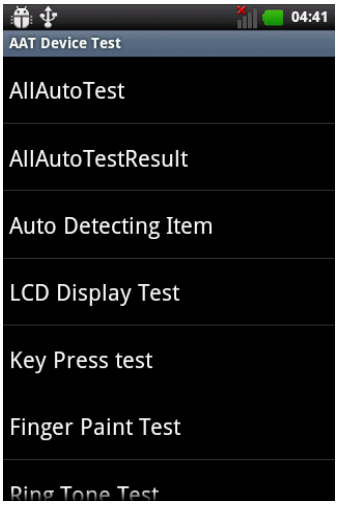


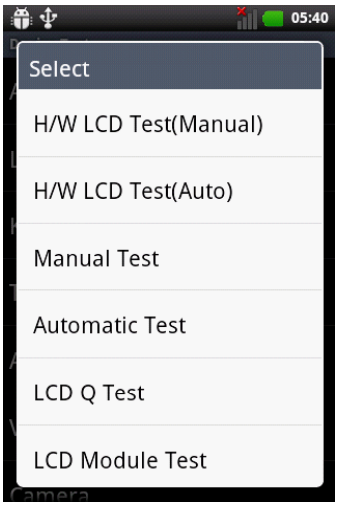
b. Calibration & autotest will be executed in order.

1) Precede Action.
   - NV write
   - Test command send.
2) Calibration
3) Auto test
4) After action
   - Phone reset
   - Change UE to AMSS

11. STAND ALONE TEST

	**Hidden Menu Start** Start shortcut keys: 3845#*698# **Hidden Menu List** Start the desired menu: Menu, click
	**Version Info** Classified Information representation
	**Factory Reset** Format SD Card : SD Card Data reset Factory Reset : Changing the Factory Delete Userdata : Disabled

<table>
<tr>
<td> 
</td>
<td>Device Test List
Auto All Test :
-> Auto All Test menu click
-> Continuous information on the menu, giving you ability test</td>
</tr>
<tr>
<td> 
</td>
<td>Auto All Test Result
Auto All Test Result
-> From the factory with the ability to view the results screen</td>
</tr>
<tr>
<td> 
</td>
<td>AAT Device Test List
Auto All Test : Device functionality testing at the factory to use
Auto All Test Result : Test Result
Auto Detecting Item : Check USIM, SD Card, Ear phone and Charging Mode
LCD Display Test : Display test(status)
Key Press Test : Check Key, Proximity and Compass
Vibrator Test : Vibrator test
Camera Test : Camera & Cam test
Sound Test : Sound test
RTC Test : Date/Time Setting
Touch Test : Display touch test
Motion Sensor test : Motion Sensor test
External Memory Test : SD Card Write test
GPS Test : GPS Test</td>
</tr>
</table>

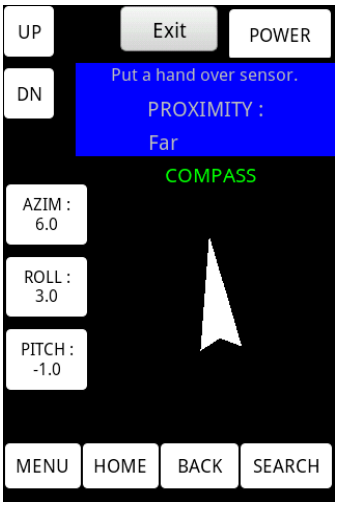


LCD Test List

Manual Test : Click on the following screen

Automatic Test : Automatically, without clicking

- White Display
- Black Display
- Red,Green, Blue, White Display
- Red,Green, Blue, White Display 2



Key Press Test

(with Proximity and Compass)

Up/Down key : Check Recognition

Power key : Check Recognition

Menu key : Check Recognition

Home key : Check Recognition

Back key : Check Recognition

Search key : Check Recognition

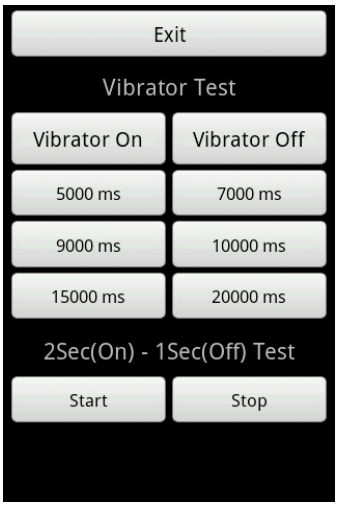
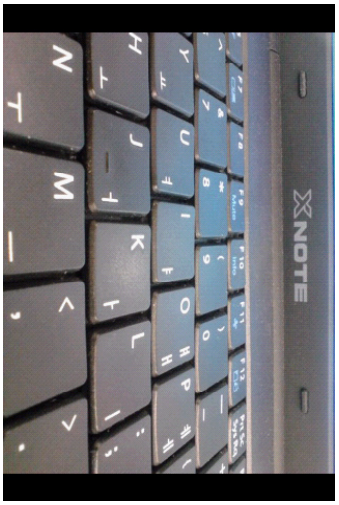
Proximity

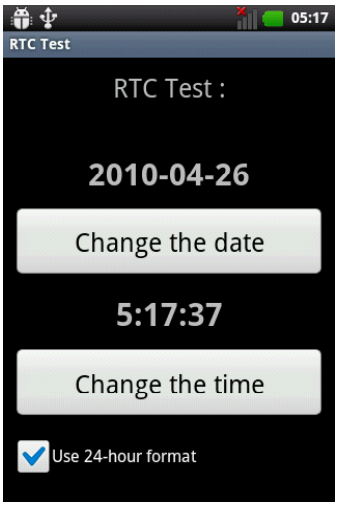
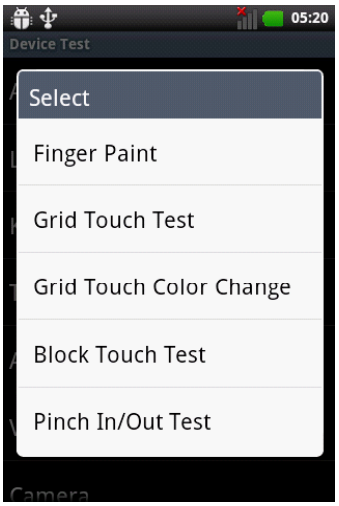
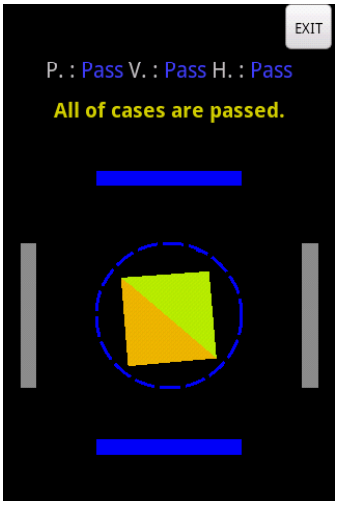
Phone contact with your fingers in the top of the sensor determine the sensor response

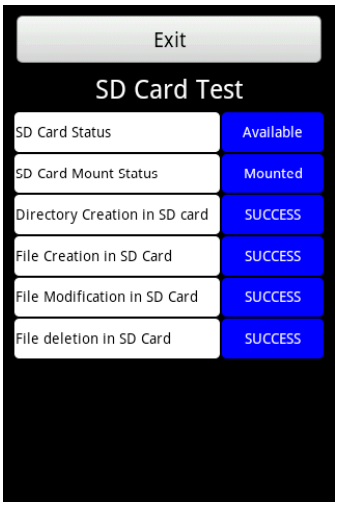
- Far
- Near

Compass

Compass test

	**Vibrator test – On/Off** A case-by-state vibration tests
	**Camera test - Snapsho** Menu features disabled This feature is a part of Auto All Test replaced by -> Auto All Test -> Camera test -> Cam test
	**Ring Tone Test** **-** Play - Stop

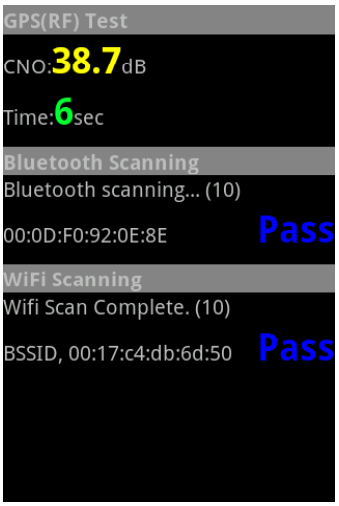
	**RTC test** Date & time : setting
	**Touch test** Finger Print : Free mode test Grid Touch Test : Block mode on Grid Touch Color Change Block Touch Test Pinch In/Out Test
	**Motion Sensor test** Motion Sensor test -> 3 Check the operation of the sensor in the direction of lean - Planiform - Vertical - Horizontal



External Memory Test

SD Card test

-> Write a test check of the SD Card memory

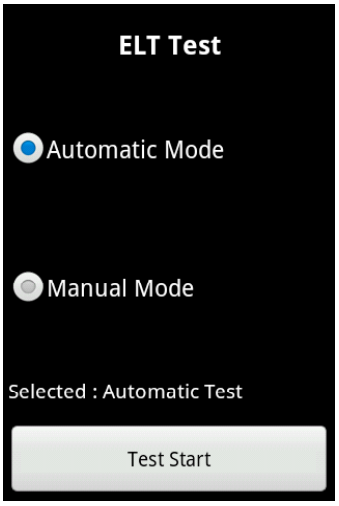


GPS Test

GPS test : GPS check recognition

Bluetooth test : Bluetooth check recognition

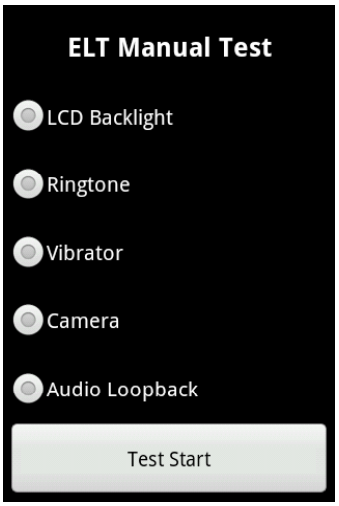
WIFI test : WIFI check recognition



ELT Test

Automatic Mode

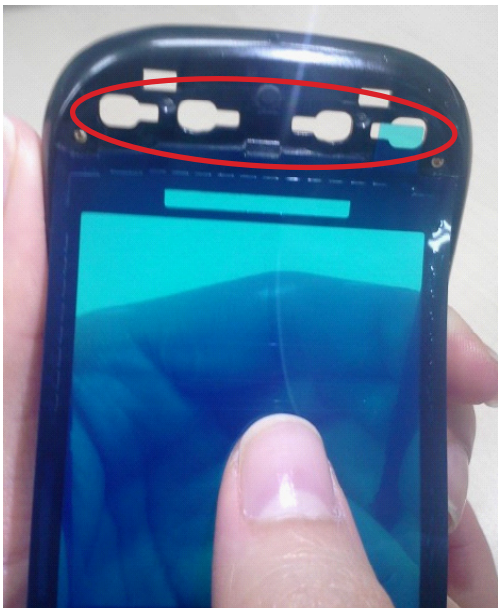
Manual Mode :

	**ELT Test** Automatic Mode : LCD Automatic on/off test -> time setting
	**ELT Manual Test** LCD Backlight Ringtone Vibrator Camera Audio Loopback -> test on the device is working (The ability to use plant)

12. ASSEMBLE GUIDE

12.1 Attach Tape Pad Window

Attach the tape pad window to Front cover using Red-marking line(boundary line between main key and window glass) from the bottom side.
TIP : Easy to do this process with holding the front cover upside down.

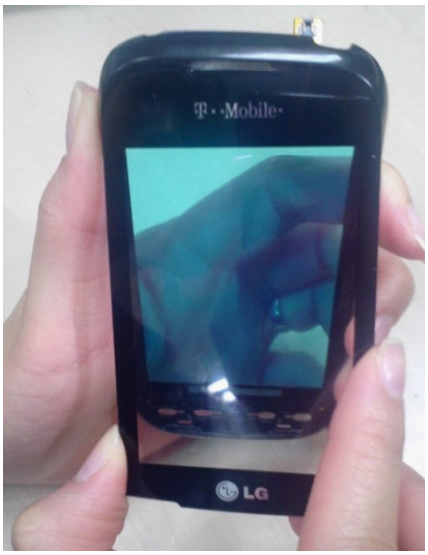


12.2 Attach Touch Window

1. Remove the front protection film
   TIP : Red mark is finger-grip

2. Insert window PCB into upper hole of the Front cover

3. Attach Touch window to the front cover adjusting upper side



4. Complete

12.3 Attach LCD to LCD Bracket

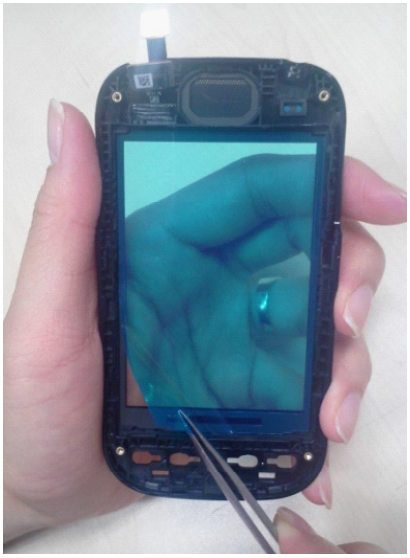
1. Attach bracket tape to the LCD bracket

2. Insert LCD FPCB to the bracket

3. Fix the LCD to the bracket from the upper side

12.4 Attach LCD module to the front cover

1. Remove inner protection film



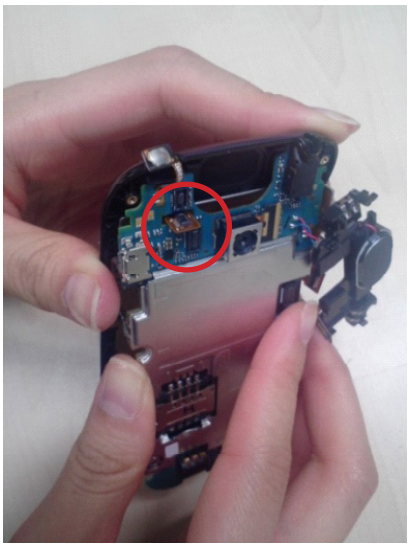
2. Attach LCD to the front cover adjusting upper boundary line

3. Attach LCD to the front cover completely

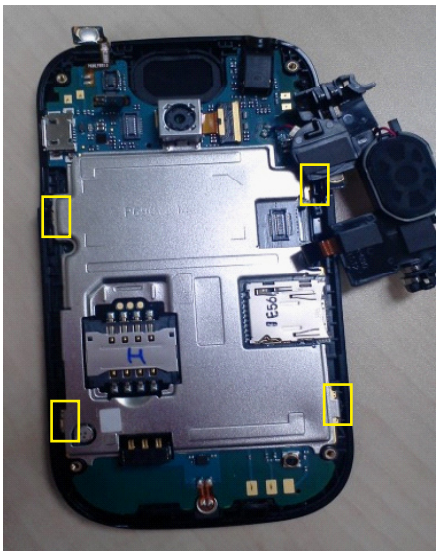
4. Attach touch window FPCB to the front cover hole

12.5 Attach main PCB

1. Insert touch window FPCB into main PCB hole and fix it

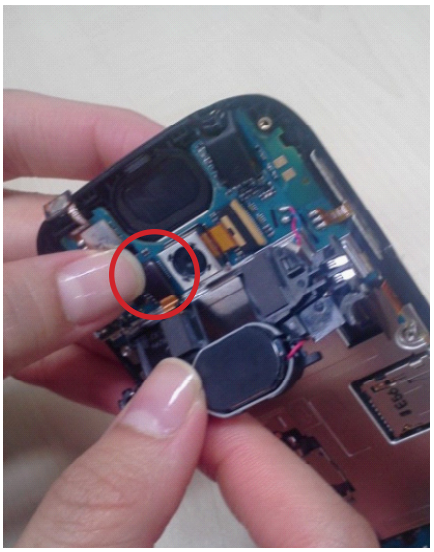


2. Hook PCB to the front cover (4points)



3. Attach main PCB to the window PCB

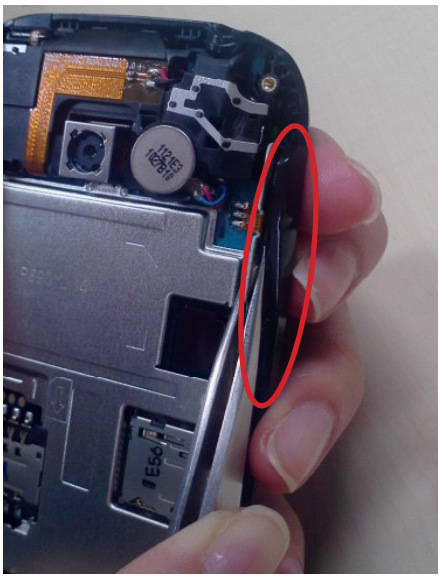
4. Attach Speaker PCB to the Main PCB



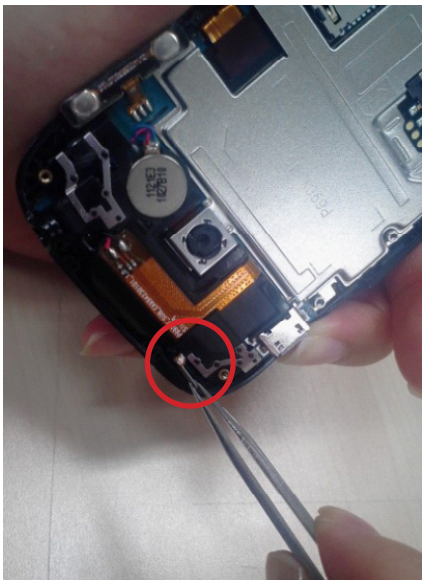
5. Fix the speaker to the main PCB with side hook (2points)

67. Attach LCD PCB to the main PCB

7. Insert volume key FPCB into the front cover hole



8. Insert Power Key FPCB into the front cover hole

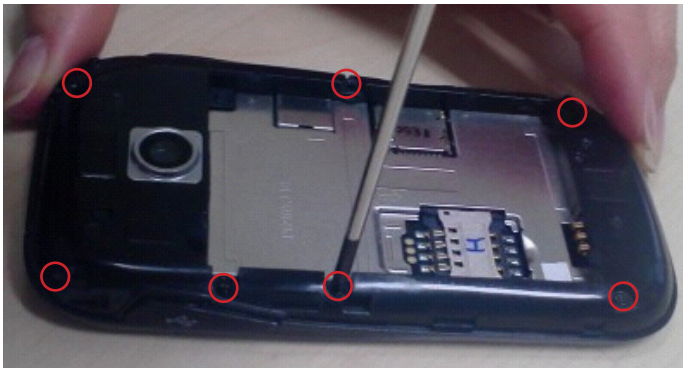


12.6 Assemble Rear Cover

Hook the rear cover to the front cover (7points)

Tip : hard to hook up bottom side so as to push the rear cover powerfully

Tighten the screws (7points)



12.7 Attach Main Key

Put the main key button in the front cover upside first

12.8 Battery & Battery Cover

Insert the battery and attach the battery cover

13. DISASSEMBLE GUIDE

13.1 Disassemble Battery Cover

Take apart the battery cover using notch below

13.2 Disassemble Battery & Screw

Take apart the battery and remove screw (7pcs)

13.3 Disassemble Rear Cover

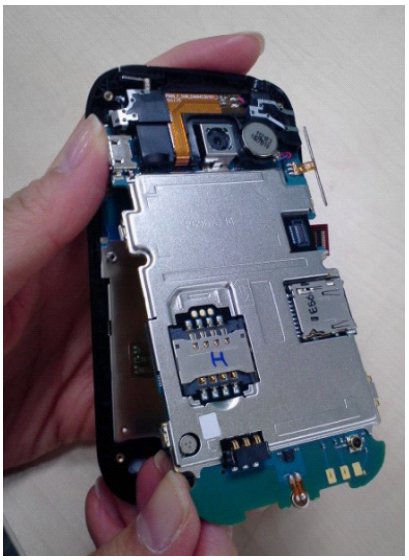
Take apart the Rear cover out of Front cover starting from upper side

13.4 Disassemble Main PCB

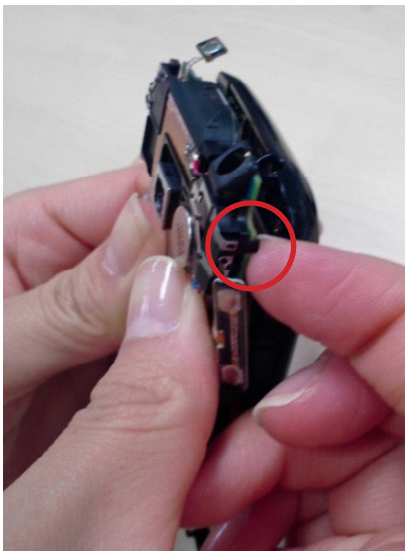
1. Take the LCD PCB out of Main PCB

2. Widen the gap between F/cover and main PCB and hook off

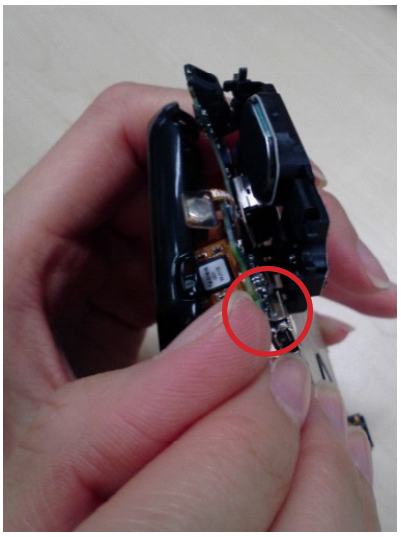
3. Tip : Easy to take apart the main PCB from bottom side



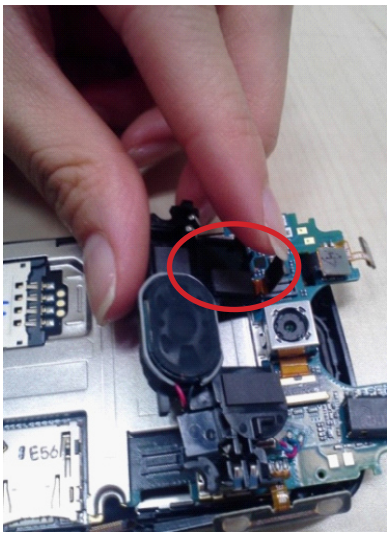
4. Hook off the right side first for disassembling speaker



5. Hook off the other side like previous process



6. Take the speaker PCB out of the main PCB



7. Take the T/window PCB out of the main PCB

8. Complete disassembling Main PCB

13.5 Disassemble LCD

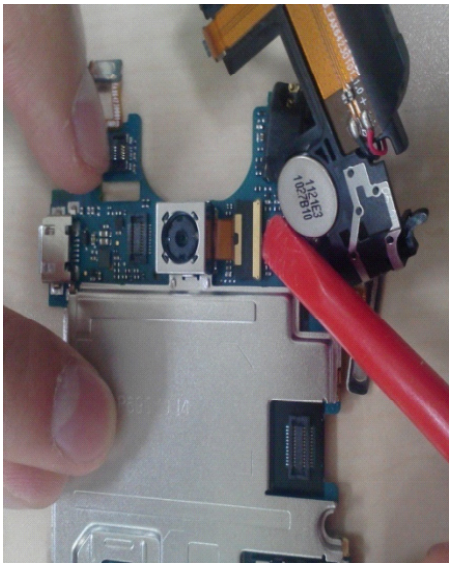
Widen the gap between F/cover and LCD module and then hook off
Tip: Easy to take apart the LCD module from bottom side of the left

13.6 Complete disassembling P698

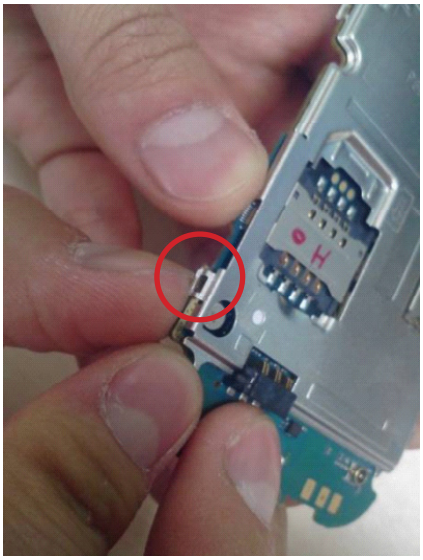
13.7 Disassemble Shield Can

1. Put the main PCB on the table

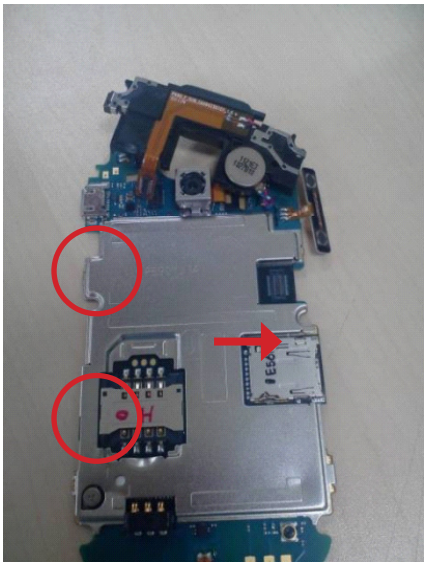
2. Detach camera connector out of main PCB



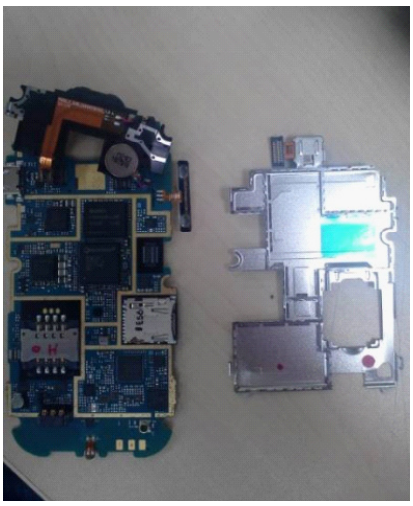
3. Hook off the left side (2points) and pull on the other side



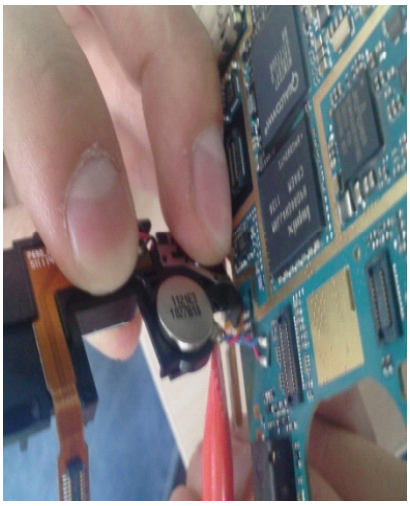
4. * Location of hook and pushing direction



5. Complete disassembling Shield Can & main PCB



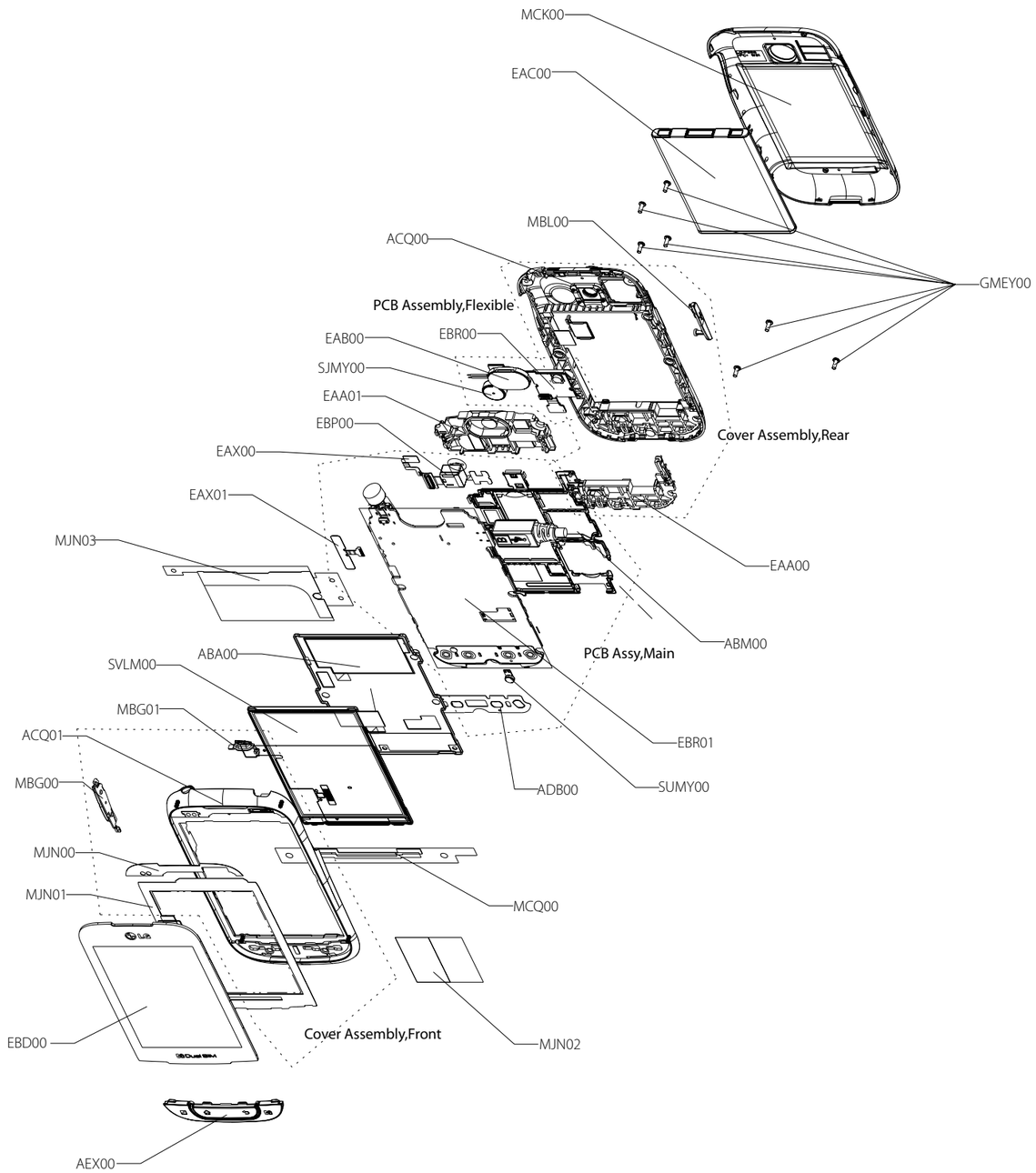
6. Detach the vibrator out of main PCB



7. Complete disassembling Shield Can & Speaker Bracket assy

14. EXPLODED VIEW & REPLACEMENT PART LIST

14.1 EXPLODED VIEW



Location	Description
ACQ00	Cover Assembly,Rear
EAA00	PIFA Antenna,Multiple
MBL00	Cap,Receptacle
AEX00	Keypad Assembly,Main
EBD00	Touch Window Assembly
MCQ00	Damper,LCD
ACQ01	Cover Assembly,Front
MBG00	Button,Side
MBG01	Button
MJN00	Tape,Window
MJN01	Tape,Window
ABA00	Bracket Assembly
SVLM00	LCD,Module-TFT
MJN02	Tape
MJN03	Tape
EAA01	PIFA Antenna,GPS
EBR00	PCB Assembly,Flexible
SJMY00	Motor,DC
EAB00	Speaker,Dual Mode
GMEY00	Screw,Machine
EBR01	PCB Assembly,Main
SUMY00	Microphone,Condenser
EBP00	Camera Module
EAX00	PCB,Sidekey
EAX01	PCB,Sidekey
ADB00	Dome Assembly,Metal
ABM00	Can Assembly,Shield
EAC00	Rechargeable Battery,Lithium Ion
MCK00	Cover,Battery

14.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
1	AGF000000	Package Assembly	AGF76281729	LGP698.ACISBK ZZ:Without Color LG-P698 CIS(EU1W/CIS_UB/CIS Peel_China/CIS Body/720EA)	
2	MAY084000	Box,Unit	MAY65216914	BOX Paper 120 90 56 4 COLOR LGP698.ACISBK ZZ:Without Color LGP698(Gelato) CIS Unit Box(EU1W)	
2	MEZ084100	Label,Unit Box	MLAQ0018301	PRINTING GS200 CISBK ZZ:Without Color Unit Box Label(CIS USE-LGE-Peel-90*40) CIS only_Koerea_Peel_unit box label_90×40	
2	AGJ000000	Pallet Assembly	APLY0003911	GT540.ACISBK ZZ:Without Color EU1 TYPE_CIS_CIS Body(SW)+Cap(EU)+AL_720ea	
3	MAY010800	Box,Carton	MBEC0003604	COMPLEX GX300.ACISWR ZZ:Without Color EU1 CIS Body(720ea/H:605mm)	
3	MCCL00	Cap,Box	MCCL0002501	COMPLEX GD510 CZESV ZZ:Without Color -	
3	MPCY00	Pallet	MPCY0012403	COMPLEX KG800 FRABK DB:DARK BLUE -	
2	MBAD00	Bag,Vinyl	MBAD0005204	COMPLEX LG-LX260 SPRAG ZZ:Without Color -	
2	MBEE00	Box,Master	MBEE0061001	COMPLEX GD510.ACZESV ZZ:Without Color EU1 Master Box	
2	MLAJ00	Label,Master Box	MLAJ0004402	PRINTING CG300 CGR DG ZZ:Without Color LABEL MASTER BOX(for CGR TDR 2VER. mbox_label) GSM standard_master box label	
2	MLAZ01	Label	MLAZ0050901	COMPLEX KU990.AGBRBK ZZ:Without Color Battery Warning Label (Lithium ion Battery Label)	
1	AGQ000000	Phone Assembly	AGQ86769601	LGP698.ACISBK BK:BLACK BLACK refer to AGQ86627702-DD (uads)	
2	ACQ100400	Cover Assembly,EMS	ACQ85917101	LGP698.ACISBK BK:BLACK BLACK -	
3	ACQ00	Cover Assembly,Rear	ACQ85625901	LGP698F.ABRABK BK:BLACK BLACK -	
4	EAA00	PIFA Antenna,Multiple	EAA62608901	KI-M09685 MULTI -2DB 5 Metal Stamping Type - KOMATECH CO.,LTD	

Level	LocationNo.	Description	PartNumber	Spec	Remark
4	MHK000000	Sheet	MHK63510001	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	MBK070300	Can,Shield	MBK63033901	COMPLEX LGP698F.ABRABK ZZ:Without Color PRESS, STS,	
4	MBL00	Cap,Receptacle	MBL65040301	COMPLEX LGP698F.ABRABK BK:BLACK BLACK -	
4	MCK063300	Cover,Rear	MCK66823201	COMPLEX LGP698F.ABRABK BK:BLACK BLACK -	
4	MCQ009400	Damper,Camera	MCQ66703701	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	MEZ000900	Label,After Service	MLAB0004801	COMPLEX LG-LB3300 LGT ZZ:Without Color -	
4	MCQ043300	Damper,LCD	MCQ66720901	COMPLEX LGP698F.ABRABK BK:Black -	
4	MCR000000	Decor	MCR64531101	COMPLEX LGP698F.ABRABK ZZ:Without Color PC	
4	MJN061100	Tape,Protect	MJN67877201	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	MJN009400	Tape,Camera	MJN67898901	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	MKC009400	Window,Camera	MKC64079401	COMPLEX LGP690.ADEUBK BK:Black -	
4	MCQ049800	Damper,Motor	MCQ66703801	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
3	ACQ003400	Cover Assembly,Bar	ACQ85625501	LGP698F.ABRABK BK:BLACK BLACK -	
4	AEX00	Keypad Assembly,Main	AEX73798201	LGP698F.ABRABK BK:Black -	
4	EBD00	Touch Window Assembly	EBD61226501	H038J CAPACITIVE TOUCH PMMA/Film/Film Synaptics T1320 3.2 inch B to B - Young Fast Optoelectronics Co., Ltd.	
4	MEZ000000	Label	MLAZ0038303	COMPLEX LG-LC3200 WA:White PRINTING, PPRI PRINTING	
4	MJN061100	Tape,Protect	MJN67877301	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	MCQ00	Damper,LCD	MCQ66811001	COMPLEX LGP690.AITABK BK:Black -	
4	ACQ01	Cover Assembly,Front	ACQ85630701	LGP698F.ABRABK BK:BLACK BLACK -	
5	MBG00	Button,Side	MBG64325101	COMPLEX LGP698F.ABRABK BK:Black -	
5	MBG01	Button	MBG64325001	COMPLEX LGP698F.ABRABK BK:Black -	

Level	LocationNo.	Description	PartNumber	Spec	Remark
5	MCK032700	Cover,Front	MCK66823101	COMPLEX LGP698F.ABRABK BK:BLACK BLACK -	
6	MET099500	INSERT,NUT	MICE0016907	MECH_COMMON ZY,ZZ,PRESS, STS, , , , ,	
5	MCQ074200	Damper,Speaker	MCQ66699401	COMPLEX LGP698F.ABRABK BK:Black -	
5	MJN00	Tape,Window	MJN67898701	COMPLEX LGP698F.ABRABK BK:Black -	
5	MCR000000	Decor	MCR64488701	PRESS SUS 304 0.2 LGP690.ADEUBK BK:Black -	
5	MEG000000	Holder	MEG62888301	COMPLEX LGP698F.ABRABK BK:Black -	
5	MJN000000	Tape	MJN67876801	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
5	MJN01	Tape,Window	MJN67898601	COMPLEX LGP698F.ABRABK BK:Black -	
5	MCQ000000	Damper	MCQ66702901	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	ABA00	Bracket Assembly	ABA74068701	LGP698F.ABRABK ZZ:Without Color -	
5	MDS000000	Gasket	MDS63831101	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
5	MAZ000000	Bracket	MAZ63250001	COMPLEX LGP698F.ABRABK ZZ:Without Color PRESS, STS, refer to ABA74068701-MP	
5	MJN000000	Tape	MJN67948601	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
4	SVLM00	LCD,Module-TFT	SVLM0041401	TX08D42VM0BAA Main,3.2,HVGA,49.52x77.83x1.9t,16.7M,TFT,TM,S 6D05A1(Samsung),Bending Type, HITACHI DISPLAYS.,LTD	
4	MJN02	Tape	MJN67973101	COMPLEX LGP690.ADEUBK ZZ:Without Color -	
4	MJN03	Tape	MJN68073501	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
3	ABA000000	Antenna Assembly	EAA62608801	HIR-02B26-MA00AA LGP698.ABRABK BK BK ASSY E.M.W CO., LTD.	
4	EAA01	PIFA Antenna,GPS	EAA62608702	KI-M15690 SINGLE -2DB 5 Metal Stamping Type - KOMATECH CO.,LTD	
4	EBR00	PCB Assembly,Flexible	EBR74676301	LGP698F.ABRABK 1.1 Flexible	
5	EBR070400	PCB Assembly,Flexible,	EBR73785001	LGP698F.ABRATN 1.0 Flexible	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	EBR070300	PCB Assembly,Flexible,	EBR73785201	LGP698F.ABRATN 1.0 Flexible	
7	EAX010700	PCB,Flexible	EAX64323501	LGP698F.ABRATN 1.0 POLYI Double 2 0.15 Flexible	
7	BAT9000	Capacitor Assembly	SMZY0023501	PAS311HR-VG1 3.8 Backup Capacitor 0.03F,Module Assembly, KOREA TAIYO YUDEN.CO., LTD.	
6	EBR070200	PCB Assembly,Flexible, SMT Bottom	EBR73785101	LGP698F.ABRATN 1.0 Flexible	
7	CN9000	Connector,BtoB	ENBY0039501	GB042-20P-H10-E3000 20P 0.40MM STRAIGHT PLUG SMD R/TP 1M - LS Mtron Ltd.	
4	SJMY00	Motor,DC	SJMY0007104	3V 80mA 0A 12KRPM 0RPM 0SEC 0GF.CM 0OHM	
4	EAB00	Speaker,Dual Mode	EAB62189401	BRS-181225SL08-P Nd-Fe-B 700mW 8OHM 91DB 710HZ 1812*3.0, 10mm WIRE BUJEON ELECTRONICS CO., LTD	
3	GMEY00	Screw,Machine	GMEY0013901	BH + 1.4mM 4mM MSWR FZB N - ARIMA COMMUNICATIONS CORP.	
3	EAN011400	IC,Memory Card,MICRO SD	EAN61826701	MMAGR02GUECA-2MBTN 2GBYTE 2.7VTO3.6V MICRO SD CARD 15.0x11.0x1.0MM TR 8P MicroSD Card 2GB SAMSUNG ELECTRONICS CO., LTD.	
3	EBR01	PCB Assembly,Main	EBR73784402	LGP698.ACISBK 1.0 Main	
4	EBR071800	PCB Assembly,Main,SM	EBR73784502	LGP698.ACISBK 1.0 Main	
5	EBR071700	PCB Assembly,Main,SM	EBR73784801	LGP698.ABRABK 1.0 Main	
6	VA5004	Capacitor,Ceramic, Chip	ECCH0000198	CL05A225MQ5NSNC 2.2uF 20% 6.3V X5R -55TO+85C 1005 R/TP . SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	VA7014	Diode,TVS	EDTY0010101	ESD9B5.0ST5G ESD9B5.0ST5G,SOD-923,5 V,300 mW,R/TP,15pF SCG HONG KONG SAR LTD.	
6	EAX010000	PCB,Main	EAX64293901	LGP698F.ABRATN 1.1 FR-4 LX-BUMP 8 0.8 Main	
6	LD5000, LD5001, LD5002, LD5003	LED,Chip	EDLH0014803	SSC-WH107 WHITE 2.7~3.1 20mA 100~230mcd x, y 64mW 1608 R/TP 2P - SEOUL SEMICONDUCTOR CO.,LTD	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	VA6003, VA6004, VA6005, VA6006	Varistor	SEVY0008101	EVLC5S01033 EVLC5S01033,5.5 V, ,SMD ,0603 AMOTECH CO., LTD.	
5	EBR071600	PCB Assembly,Main,SM	EBR73784701	LGP698.ABRABK 1.0 Main	
6	FL1102	Filter,Duplexer,IMT	SDMY0002801	B7953 942500000 925 to 960 897500000 880 to 915 3.8 2.9 2.5x2.0x0.94 DUAL SMD R/TP - EPCOS PTE LTD.	
6	FL1103	Filter,Saw	SFSY0037601	B9442 897.5MHz 1.4*1.1*0.4 SMD R/TP 5P EPCOS PTE LTD.	
6	VA6000, VA6001, VA6002	Varistor	EAF61450601	EVLC 5S 01 100 5.5V 0% 100pF 0.6X0.3X0.3MM IEC61000-4-2 (ESD) level #4 SMD R/TP AMOTECH CO., LTD.	
6	VA7014	Diode,TVS	EDTY0010101	ESD9B5.0ST5G ESD9B5.0ST5G,SOD-923,5 V,300 mW,R/TP,15pF SCG HONG KONG SAR LTD.	
6	VA5000, VA5001, VA5002, VA5003, VA7000, VA7001	Varistor	SEVY0004301	ICVL0518100Y500FR 18V 0% 10F 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	
6	VA6003, VA6004, VA6005, VA6006	Varistor	SEVY0008101	EVLC5S01033 EVLC5S01033,5.5 V, ,SMD ,0603 AMOTECH CO., LTD.	
6	VA7015, VA7016, VA7017, VA7018, VA7019, VA7020, VA7021, VA7022	Varistor	SEVY0004001	EVLC18S02003 18V 0% 3F 1.0*0.5*0.6 NONE SMD R/TP AMOTECH CO., LTD.	
6	VA5004	Capacitor,Ceramic, Chip	ECCH0000198	CL05A225MQ5NSNC 2.2uF 20% 6.3V X5R -55TO+85C 1005 R/TP . SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	VA2000, VA2001, VA2002, VA2003, VA2004, VA2005	Varistor	SEVY0004401	ICVL0518400V500FR 18V 0% 40pF 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	ZD1100, ZD8000	Diode,TVS	EDTY0010501	RCLAMP1521P.TCT 15V 16.7 28V 4A 0W SLP1006P2 R/TP 2P 1 SEMTECH CORPORATION	
6	FL5000, FL5001, FL5002	Filter,EMI/Power	SFEY0016901	ICVE10184E070R500 ESD/EMI 0HZ 0.0000000000075F 0H SMD R/TP INNOCHIPS TECHNOLOGY	
6	FL4000	Filter,EMI/Power	SFEY0015301	NFM18PC104R1C3 ESD/EMI 0HZ 0.1uF 0H SMD R/TP MURATA MANUFACTURING CO.,LTD.	
6	VA7011, VA7012	Varistor	SEVY0004101	ICVN0505X150FR 5.6V 0% 360F 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	
6	ZD4000	Diode,TVS	EDTY0008602	PSD12-LF 12V 13.3 25.9V 21A 500W SOD323 R/TP 2P 1 PROTEK DEVICES INC.	
6	FL1104	Filter,Duplexer,IMT	SDMY0003001	B7697 2140000000 2112.4 to 2167.6 1950000000 1922.4 to 1977.6 2.2 1.8 2.5x2.0x0.89 DUAL SMD R/TP - EPCOS PTE LTD.	
6	VA7004, VA7005, VA7007, VA7008, VA7009, VA7010	Varistor	SEVY0005101	ICVL0518050FR 18V 0% 5F 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	
6	FL1106	Filter,Saw	SFSY0033404	B9444 1575.42MHz 1.4*1.1*0.45 SMD R/TP 5P EPCOS PTE LTD.	
6	CN4001	Connector,Terminal Block	ENZY0030401	KQ03LV-3R 3,2.5 mm,STRAIGHT,Gold,Twin One board 5.4mm HIROSE KOREA CO.,LTD	
6	FB1100, FB1101, FB8003, FB8004	Filter,Bead	SFBH0008101	BLM15AG601SN1D 600 ohm 1.0X0.5X0.5 25% 0.6 ohm 0.3A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	FB8000, FB8001, FB8002	Filter,Bead	SFBH0007101	BLM15AG121SN1D 120 ohm 1.0X0.5X0.5 25% 0.25 ohm 0.5A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	FL8000	Filter,Ceramic	EAM62250401	LFB212G45CG7D227 BPF 2.45KHZ 100Hz SMD R/TP 3P MURATA MANUFACTURING CO.,LTD.	
6	VA7006, VA7013	Varistor	SEVY0003601	ICVL0505101V150FR 5.6V 0% 60F 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	
6	CN5000	Connector,BtoB	ENBY0040301	GB042-34S-H10-E3000 34P 0.4MM STRAIGHT SOCKET SMD R/TP 1M - LS Mtron Ltd.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	IC7000	IC,Audio Sub System	EUSY0403901	WM9093ECS/R 1.71~5.5V 0W WLCSP R/TP 20P - WOLFSON MICROELECTRONICS PLC	
6	FL1100	Filter,Separator	SFAY0012501	D5017 1.5 35 35 ,dB,dB,dB,dB,4532,FEM/SP9T, Supply voltage(2.5V min, 3.2V max) EPCOS PTE LTD.	
6	FL4001	Filter,EMI/Power	SFEY0016301	ICMEF112P900M COMMON MODE NOISE FILTER 0HZ 0F 0H SMD R/TP INNOCHIPS TECHNOLOGY	
6	SW1100	Connector,RF	EAG62970901	KMS-518(P)-BEF NONE STRAIGHT SOCKET SMD T/REEL AU 50OHM 400mDB HIROSE KOREA CO.,LTD	
6	ZD4001	Diode,TVS	EDTY0008601	PSD05-LF 5V 6 13.5V 42A 500W SOD323 R/TP 2P 1 PROTEK DEVICES INC.	
6	FL1101	Filter,Saw	SFSY0035001	B9411 2140 1.4*1.1*0.45 SMD R/TP - EPCOS PTE LTD.	
6	FL1105	Filter,Saw	SFSY0035101	B9414 1950 1.4*1.1*0.45 SMD R/TP - EPCOS PTE LTD.	
6	CN4000	Connector,I/O	ENRY0008801	GU073-5P-SD-E1500 GU073-5P-SD-E1500,5,mm,ANGLE LS Mtron Ltd.	
6	CN5001	Connector,BtoB	ENBY0034201	GB042-24S-H10-E3000 24P 0.40MM STRAIGHT SOCKET SMD R/TP 1M - LS Mtron Ltd.	
6	FL5003	Filter,EMI/Power	SFEY0015901	ICMEF214P101MFR ICMEF214P101MFR,SMD,ESD Common mode Filter INNOCHIPS TECHNOLOGY	
6	CN6001	Connector,BtoB	ENBY0058601	51338-9873 10P 0.40MM STRAIGHT FEMALE SMD R/TP 1.5M - HANKOOK MOLEX	
5	MEZ000000	Label	MLAZ0038301	COMPLEX LG-VX6000 ZZ:Without Color PID Label 4 Array PRINTING,	
4	EBR071500	PCB Assembly,Main,Insert	EBR74182103	LGP698F.ABRATN 1.0 Main	
5	SUMY00	Microphone,Condenser	SUMY0003816	OBM-410L44-RC1882 -44DB 2.2KOHM OMNI 1TO10V 4x1.0t FPCB BSE CO., LTD.	
5	EBP00	Camera Module	EBP61342001	CW3028-AK5CA CW3028-AK5CA 3M AF SS-LSI 1/5", FPCB 90deg. 3.5mm COWELL ELECTRONICS CO.,LTD	
5	EAX00	PCB,Sidekey	EAX64302001	LGP698F.ABRABK 1.0 POLYI Double 2 0.18 Sidekey	
5	EAX01	PCB,Sidekey	EAX64301901	LGP698F.ABRABK 1.1 POLYI Double 2 0.18 Sidekey	

Level	LocationNo.	Description	PartNumber	Spec	Remark
5	ADB00	Dome Assembly,Metal	ADB73718701	LGP698F.ABRABK ZZ:Without Color P698 DOME ASSY, METAL	
5	RAA050100	Resin,PC	BRAH0001301	UF2040 or 3075BHF . . NONE	
5	ABM00	Can Assembly,Shield	ABM73617101	LGP698F.ABRABK ZZ:Without Color -	
6	MEV000000	Insulator	MEV64151201	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
6	MJN009400	Tape,Camera	MJN67876901	COMPLEX LGP698F.ABRABK ZZ:Without Color -	
6	MBK070300	Can,Shield	MBK63034201	COMPLEX LGP698.ABRABK ZZ:Without Color P698 CAN SHIELD	
2	MEZ002100	Label,Approval	MLAA0062316	COMPLEX GU280 OREBK ZZ:Without Color COMPLEX, (empty), , , , ,	
1	AAD000000	Addition Assembly	AAD85992501	LGP698.ACISBK BK:Black -	
2	MEZ002100	Label,Approval	MEZ63927701	COMPLEX LGP500.ACISBK ZZ:Without Color Label (Kazakhstan KST Mark)	
2	MEZ002101	Label,Approval	MEZ64188201	COMPLEX LGA190.ACISBK ZZ:Without Color -	

14.2 ReplacementParts <Main component>

Note: This Chapterisused for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
7	S9000	Socket,Card	ENSY0023802	SCHB1B0201 Micro-SD 8P ANGLE SMD R/TP - ALPS ELECTRIC KOREA CO.,LTD.	
7	L7000, L7001, L7002, L7003	Inductor,Multilayer, Chip	ELCH0001444	0402AF-101XJEW 100NH 5% - 900mA 0.16OHM 1.4GHZ 8 NON SHIELD NONE 1.12X0.66X0.66MM R/TP COILCRAFT SINGAPORE PTE LTD.	
6	R7028	Resistor,Chip	ERHY0000283	MCR01MZP5J134 130KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	Q7000	FET	EBK61592701	RZE002P02TL P-CHANNEL MOSFET -20V +-10 200mA 1.5OHM 150mW EMT3 R/TP 3P ROHM Semiconductor KOREA CORPORATION	
6	R5006, R5007, R5008, R5009	Resistor,Chip	ERHZ0000434	MCR01MZP5J1R0 1OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R6017	Resistor,Chip	ERHZ0000206	MCR01MZP5F10R0 10OHM 1% 1/16W 1005 R/TP - ROHM.	
6	C6012	Capacitor,Ceramic, Chip	ECCH0017601	CL05A475MQ5NRNC 4.7uF 20% 6.3V X5R - 55TO+85C 1005 R/TP 0.5MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R6003, R6007, R6021, R6022	Resistor,Chip	ERHY0003301	MCR01MZP5J101 100OHM 5% 1/16W 1005 R/TP - ROHM.	
6	C6010	Capacitor,Ceramic, Chip	ECCH0004904	GRM155R60J105K 1uF 10% 6.3V X5R -55TO+85C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C6008	Capacitor,Ceramic, Chip	ECCH0007803	CL10A106MP8NNNC 10uF 20% 10V X5R - 55TO+85C 1608 R/TP 0.8MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C6011	Capacitor,Ceramic, Chip	ECCH0009101	C0603X5R0J104KT00NN 0.1uF 10% 6.3V X5R - 55TO+85C 0603 R/TP - TDK CORPORATION	
6	R7029	Resistor,Chip	ERHY0009518	MCR006YZPJ224 220KOHM 5% 1/20W 0603 R/TP - ROHM.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	U6003	IC,Proximity	EUSY0376201	GP2AP002S00F GP2AP002S00F,8,R/TP SHARP CORPORATION.	
6	R6010	Resistor,Chip	ERHY0009502	MCR006YZPJ100 10OHM 5% 1/20W 0603 R/TP - ROHM.	
6	C1182, L1109, L1114	Inductor,Multilayer, Chip	ELCH0003819	LQG15HS12NJ02D 12NH 5% - 300mA - - 0.28OHM 3GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L1112, L1117, L1124	Inductor,Multilayer, Chip	ELCH0003832	LQG15HS2N2S02D 2.2NH 0.3NH - 300mA - - 0.12OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L1106	Inductor,Multilayer, Chip	ELCH0004714	1005GC2T18NJLF 18NH 5% - 200mA 0.65OHM 1.6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	L1111, L1115	Inductor,Multilayer, Chip	ELCH0004720	1005GC2T1N2SLF 1.2NH 0.3NH - 300mA - - 0.12OHM 9GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	R4015	Resistor,Chip	ERHZ0000222	MCR01MZP5F1503 150KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	L1121,R1117	Resistor,Chip	ERHZ0000401	MCR01MZSJ000 0OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R7000,R7020	Resistor,Chip	ERHZ0000404	MCR01MZP5J102 1KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R2005, R6013, R6014, R7013, R7014, R7021, R7024, R7027	Resistor,Chip	ERHZ0000443	MCR01MZP5J222 2.2KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	U1102	IC,Power Amplifier	SMPY0020001	SKY77195 SKY77195,28 dBm,%,A,dBc,dB,4x5,SMD,3G Dual PAM Band 1+8. CPL integrated SKYWORKS SOLUTIONS INC.	
6	R1124, R3002, R3003, R3004, R4017	PCB ASSY,MAIN,PAD SHORT	SAFP0000401	LG-LU3000 LGTBK,MAIN,A,	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R1114, R7025	Wire Pad,Short	SAFP0000501	LG-VS760 VRZ	
6	R1115, R8001	Wire Pad,Open	SAFO0000501	AX3100 ATL SV_SHIPBACK,MAIN,A,0OHM_1005_DNI	
6	D2000, D2001, D4003	Diode,Switching	EAH61532901	BA891_ 1V 35V - - 0SEC 715mW SOD523 R/TP 2P 1 NXP Semiconductors	
6	C1167, C1171	Capacitor,Ceramic, Chip	ECCH0000104	MCH155A030C 3pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C7037, C8000	Capacitor,Ceramic, Chip	ECCH0000112	MCH155C150J 15pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C3010	Capacitor,Ceramic, Chip	ECCH0000155	MCH153CN103KK 10nF 10% 16V X7R - 55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C1130, C1137	Capacitor,Ceramic, Chip	ECCH0000175	GRM1555C1H2R7B 2.7pF 0.1PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C1123, C1127, C1180	Capacitor,Ceramic, Chip	ECCH0000180	GRM1555C1H3R3C 3.3pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C1117, C1118, C1152	Capacitor,Ceramic, Chip	ECCH0000185	GRM1555C1H5R6C 5.6pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C1110, C1112, C2005, C3021, C3023, C3024, C3034, C3035, C3044, C3053, C3054, C6005	Capacitor,Ceramic, Chip	ECCH0009106	C0603X7R1C103KT 10nF 10% 10V X7R - 55TO+125C 0603 R/TP - TDK CORPORATION	
6	L1152	Capacitor,Ceramic, Chip	ECCH0009110	C0603X7R0J223KT 22nF 10% 6.3V X7R - 55TO+125C 0603 R/TP - TDK CORPORATION	
6	C1183	Capacitor,Ceramic, Chip	ECZH0001002	C1005CH1H0R5BT000F 0.5pF 0.1PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C4045, C4065, C4066, C4068, C4069, C5000, C5001, C5004, C5005, C5013, C6000, C6001, C6004, C6006, C7000, C7003, C7008, C7009, C7012, C7015, C8022	Capacitor,Ceramic, Chip	ECZH0001215	C1005X5R1A105KT000F 1uF 10% 10V X5R -55TO+85C 1005 R/TP - TDK KOREA COOPERATION	
6	ZD4002, ZD4003	Diode,TVS	EDTY0009601	Rclamp0521P.TCT 5V 6 5V 4A 100W - R/TP 2P 1 SEMTECH CORPORATION	
6	L1104	Inductor,Multilayer, Chip	ELCH0001031	HK1005 15NJ-T 15NH 5% - 300mA 0.46OHM 2.3GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	C1168, L1107, L1153	Inductor,Multilayer, Chip	ELCH0001033	HK1005 1N5S-T 1.5NH 0.3NH - 300mA 0.1OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	L1151	Inductor,Multilayer, Chip	ELCH0001049	1005GC2T6N8JLF 6.8NH 5% - 250mA 0.32OHM 3GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	L1125	Inductor,Multilayer, Chip	ELCH0003817	LQG15HS7N5J02D 7.5NH 5% - 300mA 0.24OHM 4.2GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	C8005, C8006, C8008, C8017, C8028, C8036	Capacitor,Ceramic, Chip	ECCH0000110	MCH155A100D 10pF 0.5PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C1164, FB8005	Capacitor,Ceramic, Chip	ECCH0000143	MCH155CN102KK 1nF 10% 50V X7R -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C6010	Capacitor,Ceramic, Chip	ECCH0004904	GRM155R60J105K 1uF 10% 6.3V X5R -55TO+85C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C1135, C1142, C3005, C3030, C3039, C3048, C8010	Capacitor,Ceramic, Chip	ECCH0005604	GRM188R60J106M 10000000 pF,6.3V,M,X5R,TC,1608,R/TP,0.8 mm MURATA MANUFACTURING CO.,LTD.	
6	C4010, C4022, C8011	Capacitor,Ceramic, Chip	ECCH0007804	CL05A225MP5NSNC 2.2uF 20% 10V X5R -55TO+85C 1005 R/TP 0.5MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C6011	Capacitor,Ceramic, Chip	ECCH0009101	C0603X5R0J104KT00NN 0.1uF 10% 6.3V X5R -55TO+85C 0603 R/TP - TDK CORPORATION	
6	C8020	Capacitor,Ceramic, Chip	ECCH0009514	MCH032A(AN)100DK 10pF 0.5PF 25V X7R -55TO+125C 0603 R/TP - ROHM.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C2007, C2009, C2011, C2012, C2013, C2014, C2015, C2016, C3006, C3011, C4011, C4012, C4014, C4015, C4016, C4017, C4018, C4019, C4020, C4021, C4038, C4061, C6002, C6009, C7013, C7014, C7022, C7042, C7048, C8015, C8016, C8026, C8027	Capacitor,Ceramic, Chip	ECZH0003103	GRM36X7R104K10PT 100nF 10% 10V X7R -55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C1186, L1127	Inductor,Multilayer, Chip	ELCH0001406	LL1005-FHL4N7S 4.7NH 0.3NH - 300mA 0.2OHM 7GHZ 9 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	
6	C8001	Inductor,Multilayer, Chip	ELCH0003831	LQG15HS1N0S02D 1NH 0.3NH - 300mA 0.07OHM 10GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L1129, L1131	Inductor,Multilayer, Chip	ELCH0004709	1005GC2T3N3SLF 3.3NH 0.3NH - 300mA 0.19OHM 4.5GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	L7004	Inductor,Multilayer, Chip	ELCH0010402	LK1005 R27K-T 270NH 10% - 25mA - - 1.2OHM 120MHZ 10 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R4016	Resistor,Chip	ERHZ0000284	RC1005F434CS 430KOHM 1% 1/16W 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C7038, FB7000, FB7001, FB7003, FB7004	Filter,Bead	SFBH0008102	BLM15HD182SN1D 1800 ohm 1.0X0.5X0.5 25% 2.2 ohm 0.2A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	C8037	Capacitor,Ceramic, Chip	ECCH0000117	CL05C270JB5NNNC 27pF 5% 50V NP0 - 55TO+125C 1005 R/TP 0.5 SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C1133	Capacitor,Ceramic, Chip	ECCH0009506	MCH032A270JK 27pF 5% 25V NP0 -55TO+125C 0603 R/TP - ROHM.	
6	R7009, R7010	Filter,Bead	EAM62150401	CIC05J601NC 600 ohm 1.0X0.5X0.5 25% 0.6 ohm 0.5A SMD R/TP 2P 0 SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	U4003	IC,Mini ABB	EAN62095301	RT8965 Mini ABB Basic, MUIC, Charger IC Integrated WLCSP R/TP 25P RICHTEK TECHNOLOGY CORP.	
6	C6008	Capacitor,Ceramic, Chip	ECCH0007803	CL10A106MP8NNNC 10uF 20% 10V X5R - 55TO+85C 1608 R/TP 0.8MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	L1123	Capacitor,Ceramic, Chip	ECZH0000802	C1005C0G1H010CT 1pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C1108, C1173, C1184, C1195, C4040, L1108, L1154	Capacitor,Ceramic, Chip	ECZH0000813	C1005C0G1H101JT 100pF 5% 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C1109, C1176, C8004, C8029	Capacitor,Ceramic, Chip	ECZH0000822	C1005C0G1H1R5CT000F 1.5pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	L8002, L8003	Inductor,Multilayer, Chip	ELCH0001056	1005GC2T2N7SLF 2.7NH 0.3NH - 300mA 0.17OHM 5.5GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	C1106	Inductor,Multilayer, Chip	ELCH0001418	LL1005-FHL39NJ 39NH 5% - 200mA 1.1OHM 1.9GHZ 10 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C8012	Capacitor,Ceramic, Chip	ECZH0001216	C1005X5R1A224KT000E 220nF 10% 10V X5R -55TO+85C 1005 R/TP - TDK KOREA COOPERATION	
6	C6012	Capacitor,Ceramic, Chip	ECCH0017601	CL05A475MQ5NRNC 4.7uF 20% 6.3V X5R -55TO+85C 1005 R/TP 0.5MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R7003, R7004, R7005, R7006, R7007	Resistor,Chip	ERHZ0000486	MCR01MZP5J473 47KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R7034, R7037	Resistor,Chip	ERHZ0000485	MCR01MZP5J472 4.7KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	U8000	Filter,Separator,FEM	SMZY0028001	RF5501 - - - RF5501,QFN,12p,2.0*2.0*0.5,SP3T+LNA for BT/WiFi with BCM4325/29/30 RF MICRO DEVICES INC	
6	C3015, C3016, C3017, C3019, C3020, C3022, C3026, C3028, C3032, C3033, C3036, C3037, C3038, C3057	Capacitor,Ceramic, Chip	ECCH0034801	CL03A474MQ3NNNH 0.47 uF,6.3V,M,X5R,HD,0603,R/TP,0.0000047,20%,6.3V,X5R,-55TO+85C,0603,R/TP,.3 mm SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C3014, C3018, C4032, C4033, C4035	Capacitor,Ceramic, Chip	ECCH0017501	CL10A226MQ8NRNE 22uF 20% 6.3V X5R -55TO+85C 1608 R/TP 0.8MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C1114, C1124, C2000, C2006, C3025, C3027, C3029, C4024, C4025, C4028, C4029, C4030, C4031	Capacitor,Ceramic, Chip	ECZH0025920	GRM033R71C102K 1nF 10% 16V X7R - 55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	R2010, R2025, R3001	Resistor,Chip	ERHY0009536	MCR006YZPF1003 100KOHM 1% 1/20W 0603 R/TP - ROHM.	
6	L1105, L1118	Inductor,Multilayer, Chip	ELCH0004710	1005GC2T15NJLF 15NH 5% - 250mA 0.53OHM 2GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	R1100, R1101	Resistor,Chip	ERHY0019401	RC0603J5R6CS 5.6OHM 5% 1/20W 0603 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R1123, R2003, R4008	Resistor,Chip	ERHY0009302	MCR006YZPF1001 1KOHM 1% 1/20W 0603 R/TP - ROHM.	
6	R2001, R2004, R2015, R3000, R7035, R7036	Resistor,Chip	ERHY0009505	MCR006YZPJ103 10KOHM 5% 1/20W 0603 R/TP - ROHM.	
6	R2011, R2022, R5003, R5004	Resistor,Chip	ERHY0009526	MCR006YZPJ472 4.7KOHM 5% 1/20W 0603 R/TP - ROHM.	
6	R1102	Resistor,Chip	ERHY0009555	MCR006YZPF1202 12KOHM 1% 1/20W 0603 R/TP - ROHM.	
6	R2002, R2017, R2018, R2019, R2021, R2023, R2024	Resistor,Chip	ERHY0009503	MCR006YZPJ101 100OHM 5% 1/20W 0603 R/TP - ROHM.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C1165	Capacitor,Ceramic, Chip	ECCH0000137	C1005X7R1H331KT000F 0.33nF 10% 50V X7R - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	R1103, R1104, R1105, R1106, R1116	Resistor,Chip	ERHY0009504	MCR006YZPJ102 1KOHM 5% 1/20W 0603 R/TP - ROHM.	
6	R7001, R7002	Resistor,Chip	ERHZ0000445	MCR01MZP5J224 220KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	C1107, C1115	Capacitor,Ceramic, Chip	ECCH0009206	GRM0335C1E680J 68pF 5% 25V X7R - 55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	U6000	IC,Magnetic Sensor	EBD60985501	AMI306 1.7 to 3.6V - QFN R/TP 8P - AICHI STEEL CORPORATION	
6	R6017	Resistor,Chip	ERHZ0000206	MCR01MZP5F10R0 10OHM 1% 1/16W 1005 R/TP - ROHM.	
6	J7001	Card Socket	ENSY0024302	KP09NC-6S-2.54SF SIM 6P ANGLE SMD R/TP Stroke : 11.25mm HIROSE KOREA CO.,LTD	
6	L1120, L1130	Inductor,Multilayer, Chip	ELCH0001404	LL1005-FHL1N5S 1.5NH 0.3NH - 400mA 0.13OHM 15GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	
6	X4000	Crystal	EXXY0024301	CM315(12.5PF) 32.768KHZ 20PPM 12.5PF 32*15 SMD R/TP CITIZEN DISPLAYS CO.,LTD.	
6	X8000	Crystal	EAW61503601	1ZZCAB37400AA0A 37.4MHZ 10PPM 12F ; SMD R/TP DAISHINKU CORPORATION.	
6	C1103, C1113, C1116, C1162, C1172, C1181, C1185, C1189, C1190, C4013, C4064, C5010, C7032, C7036	Capacitor,Ceramic, Chip	ECZH0000830	C1005C0G1H330JT000F 33pF 5% 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	U6002	IC,Acceleration Sensor	EAN62027201	K3DH 3 Axis Acceleration Sensor 3X3X1 LGA R/TP 16P 3 Axis Accelerometer Sensor ST MICROELECTRONICS ASIA PACIFIC PTE LTD.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C4003, C4067	Capacitor,Ceramic, Chip	ECZH0003503	GRM188R61E105K 1uF 10% 25V X5R -55TO+85C 1608 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C4002, C4005, C4039, C4062, C4063, C7040, C7041, C7043, C7046, C7047, C7049	Capacitor,Ceramic, Chip	ECCH0000115	MCH155A220JK 22pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C2002, C2017, C7004, C7005, C7021, C7034, C7035	Capacitor,Ceramic, Chip	ECCH0000122	MCH155A470JK 47pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	R5016, R7033	Resistor,Chip	ERHZ0000406	MCR01MZP5J104 100KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R1120, R7030, R7031	Resistor,Chip	ERHZ0000348	MCR01MZP5F12R0 12OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R2016	Resistor,Chip	ERHY0042409	RC0201FR-0749R9L 49.9OHM 1% 1/20W 0603 R/TP - YAGEO CORPORATION	
6	R4005	Resistor,Chip	ERHZ0000405	MCR01MZP5J103 10KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R4018	Resistor,Chip	ERHY0009547	MCR006YZPF2003 200KOHM 1% 1/20W 0603 R/TP - ROHM.	
6	C1156, C1159, C1177, C1178, C1179, C2004, C2018	Capacitor,Ceramic, Chip	ECCH0009103	C0603C0G1H101JT00NN 100pF 5% 50V C0G - 55TO+125C 0603 R/TP - TDK CORPORATION	
6	L1122	Inductor,Multilayer, Chip	ELCH0001420	LL1005-FHL3N9S_ 3.9NH 0.3NH - 300mA 0.18OHM 7.4GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	
6	R4004	Resistor,Chip	ERHZ0000488	MCR01MZP5J4R7 4.7OHM 5% 1/16W 1005 R/TP - ROHM.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R4007	Resistor,Chip	ERHZ0000288	MCR01MZP5F4703 470KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R4013	Resistor,Chip	ERHZ0004201	RC1005F1213CS 121KOHM 1% 1/16W 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	L8004	Inductor,Wire Wound,Chip	ELCP0009409	LQM2HPN2R2MG0L 2.2UH 20% - 1.3A 0.08OHM 40MHZ - SHIELD 2.5X2X1MM NONE R/TP MURATA MANUFACTURING CO.,LTD.	
6	R6000, R6001, R6002	Resistor,Chip	ERHZ0000484	MCR01MZP5J471 470OHM 5% 1/16W 1005 R/TP - ROHM.	
6	J7003	Jack,Phone	EAG62831701	KJA-PH-3-0176 4P 4P ANGLE R/TP 3.5M BLACK 5P 6.5x12.6x4.0t, Short Detect, All DIP type KSD CO., LTD	
6	R6003, R6007, R6021, R6022	Resistor,Chip	ERHY0003301	MCR01MZP5J101 100OHM 5% 1/16W 1005 R/TP - ROHM.	
6	L4001, L4002	Inductor,Wire Wound,Chip	EAP61746201	1239AS-H-4R7N=P2 4.7UH 30% - 1A - - 0.252OHM - - SHIELD 2.5X2MM NONE R/TP TOKO, INC.	
6	R2014	Resistor,Chip	ERHY0009592	MCR006YZPJ202 2KOHM 5% 1/20W 0603 R/TP - ROHM.	
6	R1119	Resistor,Chip	ERHZ0000504	MCR01MZP5J680 68OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R1121, R1122	Resistor,Chip	ERHZ0000201	MCR01MZP5F1000 100OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R5002	Resistor,Chip	ERHZ0000410	MCR01MZP5J120 12OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R4009	Resistor,Chip	ERHZ0000537	MCR01MZP5F6803 680KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	U2000	IC,Gate	EUSY0216301	NC7SV00P5X_NL SC70 ,5 PIN,R/TP ,Single 2-Input NAND Gate FAIRCHILD SEMICONDUCTOR	
6	C1104, C1111	Inductor,Multilayer, Chip	ELCH0001407	LL1005-FHL5N6S 5.6NH 0.3NH - 300mA 0.22OHM 6.1GHZ 9 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	
6	CN7000	Connector,BtoB	ENBY0039601	GB042-20S-H10-E3000 20P 0.4MM STRAIGHT SOCKET SMD R/TP 1M - LS Mtron Ltd.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C4041, C4042	Capacitor,TA,Conformal	ECTH0002002	F981A336MSA 33uF 20% 10V 3.3A -55TO+85C 6OHM 2.2X1.1X1.1MM NONE SMD R/TP - NICHICON CORPORATION, EAST JAPAN SALES OFFICE	
6	R5000, R5001	Resistor,Chip	ERHY0009516	MCR006YZPJ222 2.2KOHM 5% 1/20W 0603 R/TP - ROHM.	
6	R1111, R2000	Resistor,Chip	ERHZ0000490	MCR01MZP5J510 51OHM 5% 1/16W 1005 R/TP - ROHM.	
6	C7010, C7011, C7024, C7026	Capacitor,Ceramic, Chip	ECCH0000161	MCH153CN333KK 33nF 10% 16V X7R - 55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	L1102	Inductor,Multilayer, Chip	ELCH0004701	1005GC2T12NJLF 12NH 5% - 250mA 0.48OHM 2.1GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	C1129, C1131, C2021	Capacitor,Ceramic, Chip	ECZH0025916	GRM0335C1E330J 33pF 5% 25V NP0 - 55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	R1112, R1113	Resistor,Chip	ERHZ0000411	MCR01MZP5J121 120OHM 5% 1/16W 1005 R/TP - ROHM.	
6	C7031	Capacitor,Ceramic, Chip	ECZH0001421	C1608X5R0J225KT000N 2.2uF 10% 6.3V X5R - 55TO+85C 1608 R/TP - TDK KOREA COOPERATION	
6	C1193	Capacitor,Ceramic, Chip	ECCH0042007	GRM0335C1E6R8BD01D 6.8 pF,25V,B,C0G,TC,0603,R/TP,0.0000000000068,0.1PF,25V,C0G,-55TO+125C,0603,R/TP,0.3 mm MURATA MANUFACTURING CO.,LTD.	
6	D7006	Diode,Switching	EDSY0011901	SDB310Q 340mV 30V 200mA 1A 0SEC 150mW EMD2 R/TP 2P 1 AUK CORP	
6	X2000	Oscillator,VCTCXO	EAW61543601	X1G003581002700 19.2MHZ 2PPM 2.8V 2.5x2.0x0.8MM ; SMD R/TP EPSON TOYOCOM CORP	
6	C2025	Capacitor,Ceramic, Chip	ECZH0000803	C1005C0G1H020CT000F 2pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R2012, R2020, R6004, R6005, R6006, R6011, R6012, R6015, R6016	Resistor,Chip	ERHY0000254	MCR01MZP5J472 4.7KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R4010, R4019	Resistor,Chip	ERHZ0000203	MCR01MZP5F1002 10KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	L8005	Inductor,Multilayer, Chip	ELCH0012511	LQW15AN3N9B00D 3.9NH 0.1NH - 750mA 0.07OHM 10GHZ 25 NON SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	R7017, R7018	Resistor,Chip	ERHZ0000435	MCR01MZP5J200 20OHM 5% 1/16W 1005 R/TP - ROHM.	
6	U1100	IC,RF Transceiver,3G	EUSY0344001	RTR6285 1.8VTO3V,2.7VTO3V 500mW QFN R/TP 68P QUALCOMM INCORPORATED.	
6	U2002	IC,Flip Flop	EUSY0408201	74LVC1G79GM 1.65~5.5V - D FLIP-FLOP SOT R/TP 6P - STC CORP.	
6	C5002, C5003	Capacitor,Ceramic, Chip	ECCH0005602	GRM188R61C225K 2.2uF 10% 16V X5R - 55TO+85C 1608 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	R1110, R4033	Resistor,Chip	ERHY0009586	MCR006YZPF2201 2.2KOHM 1% 1/20W 0603 R/TP - ROHM.	
6	U4002	IC,PMIC	EUSY0342201	PM7540 -0.5~18 N/A 0W CSP R/TP 137P - QUALCOMM INCORPORATED.	
6	L1110	Inductor,Multilayer, Chip	ELCH0012508	LQP15MN2N0B02D 2NH 0.1NH - 220mA 0.3OHM 6GHZ 13 SHIELD NONE 1.0X0.5X0.35MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	C1160, C1163, C1169	Capacitor,Ceramic, Chip	ECCH0000195	GRM1555C1H3R9C 3.9pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C7001, C7025, C7027, C7028, C7030	Capacitor,Ceramic, Chip	ECCH0000120	MCH155A390J 39pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C1187, C8032, C8033	Capacitor,Ceramic, Chip	ECCH0000113	MCH155A180J 18pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	U3001	IC,MCP,NAND	EAN61955301	H9DA4GH4JJAMCR-4EM NAND/4G SDRAM/4G(2G*2/ 32bit) 1.7VTO1.95V 10.5x13.0x1.2 TR 137P NAND+DDR SDRAM FBGA NAND LBx16 (1bit ECC) 41nm + DRAM DDR 200MHz 2CS/2CKE 44nm HYNIX SEMICONDOCTOR	
6	C1154	Capacitor,Ceramic, Chip	ECCH0009226	GRM0335C1E390J 39pF 5% 25V X7R - 55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C8013	Capacitor,Ceramic, Chip	ECCH0000109	MCH155A080DK 8pF 0.5PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C4006, C4007	Capacitor,TA,Conformal	ECTH0006701	298D226X0010M2T 0.000022F 20% 10V 22UA - 55TO+85C 8OHM 1.6x0.8x0.9 NONE SMD R/TP VISHAY INTERTECHNOLOGY ASIA PTE LTD	
6	R8002	Resistor,Chip	ERHZ0000221	MCR01MZP5F1502 15KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R2007	Resistor,Chip	ERHY0024201	RC1005F6041CS 6.04KOHM 1% 1/16W 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R1108, R1109	Resistor,Chip	ERHZ0000327	MCR01MZSF1800 180OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R2009	Resistor,Chip	ERHZ0000463	MCR01MZP5J330 33OHM 5% 1/16W 1005 R/TP - ROHM.	
6	C5017, C8014	Capacitor,Ceramic, Chip	ECCH0007802	CL10A475KP8NNNC 4.7uF 10% 10V X5R - 55TO+85C 1608 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	U5000	IC,Sub PMIC	EAN62027601	DW8707 2.7 to 5.5V adj 2W QFN R/TP 24P - DONGWOON ANATECH CO.,LTD.	
6	R4006	Resistor,Chip	ERHZ0000318	MCR01MZP5F8062 80.6KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	L4003, L4004	Inductor,Wire Wound,chip	ELCP0008001	MIP2520D4R7M 4.7UH 30% 0V 1.1A 0.11OHM 0HZ 0 SHIELD 2.5X2X1MM NONE R/TP FDK CORPORATION.	
6	U8001	IC,LAN	EAN61970501	BCM4330FKFFBG 2.3V 5.5V 2.3V 5.5V 1.2V 2.9V 1.2W FCBGA R/TP 144P 2.4GHz Single Band BROADCOM ASIA DISTRIBUTION PTE LTD	
6	L1119	Inductor,Multilayer, Chip	ELCH0005004	HK1005 22NJ 22NH 5% - 300mA 0.6OHM 1.9GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	D4002	Diode,TVS	EDTY0008606	PRSB6.8C 4.7V 5.7 - - 10W - R/TP 2P 1 PROTEK DEVICES INC.	
6	R1118	Inductor,Multilayer, Chip	ELCH0001039	HK1005 2N7S-T 2.7NH 0.3NH - 300mA 0.13OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	U4001	IC,LDO Voltage Regulator	EUSY0407201	BU33TD4WNVX SSON004,4,R/TP,3.3V 150mA Single LDO,IC,LDO Voltage RegulatorIC,LDO Voltage Regulator ROHM.	
6	D5001	Diode,TVS	EDTY0009801	VSMF05LCC 5V 6V 12V 2A 25W SOT-963 R/TP 6P 5 PROTEK DEVICES INC.	
6	J7002	Card Socket	ENSY0024701	GCA26C-8S-H15-E1500 SIM 8P ANGLE SMD R/TP - LS Mtron Ltd.	
6	U6001	IC,Reset	EAN62009101	FT7521L6X 2~5V 0~5V 5mW MICROPAK R/TP 6P 1-Input Reset IC, Delay 7.5s FAIRCHILD SEMICONDUCTOR HONG KONG LTD.	
6	C2019	Capacitor,Ceramic, Chip	ECCH0010501	GRM1555C1H7R5D 7.5pF 0.5PF 50V C0G - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C8007, C8009	Capacitor,Ceramic, Chip	ECCH0000133	C1005X7R1H221KT000F 0.22nF 10% 50V X7R - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	R8005	Resistor,Chip	ERHZ0000242	MCR01MZP5F2200 220OHM 1% 1/16W 1005 R/TP - ROHM.	
6	U1103	IC,RF Amplifier	SMZY0025501	RF2815 3.3*2.1*1.0,FILTER+GPS LNA+FILTER MODULE,GPS, RF MICRO DEVICES INC	
6	U1101	IC,Power Amplifier	SMPY0019101	SKY77336 SKY77336,dBm,%,A,dBc,dB,5x5,SMD,Polar Edge for QCT SKYWORKS SOLUTIONS INC.	
6	L1103	Inductor,Multilayer, Chip	ELCH0001040	HK1005 3N9S-T 3.9NH 0.3NH - 300mA 0.21OHM 4GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	C2003	Capacitor,Ceramic, Chip	ECCH0009107	GRM033R71C222K 2.2nF 10% 16V X7R - 55TO+125C 0603 R/TP - KOREA MURATA ELECTRONICS CO. LTD.	
6	C7023	Capacitor,TA,Conformal	ECTH0001903	F980J226MMA 22 uF,6.3V,M,L_ESR,1608,R/TP NICHICON CORPORATION, EAST JAPAN SALES OFFICE	
6	L1101	Inductor,Multilayer, Chip	ELCH0001430	LL1005-FHLR10J 100NH 5% - 150mA 2.2OHM 1.03GHZ 10 SHIELD NONE 1.0X0.5X0.5MM R/TP TOKO, INC.	

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	U2001	IC,Digital Baseband Processor,3G	EUSY0392303	MSM7227T 560 NSP,ARM11(600M),UPA5.7,FWGA,8M,WVGA30fps,WM,BMP,Android BGA R/TP 560P QUALCOMM INCORPORATED.	
6	R2013	Resistor,Chip	ERHZ0000483	MCR01MZP5J470 47OHM 5% 1/16W 1005 R/TP - ROHM.	
6	C1155	Capacitor,Ceramic, Chip	ECCH0009216	GRM0335C1E220J 22pF 5% 25V X7R - 55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C7029	Capacitor,TA,Conformal	ECTH0004807	TCM1A106M8R 10F 20% 10V 500mA -55TO+85C 15OHM - - SMD R/TP ROHM.	
6	R1107	Resistor,Chip	ERHZ0000457	MCR01MZP5J300 30OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R4014	Resistor,Chip	ERHY0000105	MCR01MZP5F51R0 51OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R2006	Filter,Bead	SFBH0008107	BLM15BD221SN1D 220 ohm 1.0X0.5X0.5 25% 0.4 ohm 0.3A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	C1188	Capacitor,Ceramic, Chip	ECCH0002001	C1005JB0J104KT000F 0.1uF 10% 6.3V Y5P - 30TO+85C 1005 R/TP - TDK CORPORATION	
6	C2022	Capacitor,Ceramic, Chip	ECCH0009203	GRM033R60J333K 33nF 10% 6.3V X5R - 55TO+85C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	

14.3 Accessory

Note: This Chapterisused for reference,Part order is ordered by SBOM standard onGCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
2	EAY060000	Adapters	SSAD0038301	100-240V,5060 Hz,5.1 V,700 mA,CE,AC-DC Adaptor,90Vac~264Vac,5.1V,700mA,5060,WALL 2P,USB,	
2	AFN053800	Manual Assembly,Operation	AFN75693701	LGP698.ACISBK ZZ:Without Color LG-P698 Manual Assy for CIS	
3	MBM062600	Card,Quick Reference	MBM63619501	PRINTING LGP698.ACISBK ZZ:Without Color LG-P698 simple manual for CIS	
3	MBM087200	Card,Warranty	MCDF0011303	COMPLEX GD350 CISBK ZZ:Without Color -	
2	EAC00	Rechargeable Battery,Lithium Ion	EAC61700011	BL-44JN-WWD-TOCAD PRISMATIC 3.7V 1.5AH 300mAH 61x44x4.4 65x44x4.8 BLACK Bar type, Top cap Screw joint 444461, 1500mAh, Bar Type (Top cap screw joint), WW, down TOCAD DONGHWA	
2	MCK00	Cover,Battery	MCK66838803	MOLD PC LUPOY SC-1004A LGP698.ABRABK BK:BLACK BLACK P698 SF Battery Cover , refer to MCK66838801-MP	
2	EBX000000	Accessory,Data Cable	SGDY0016701	KCA-ET-8-0020 KCA-ET-8-0020 Micro USB, 1.2M KSD CO., LTD	
2	EAB010200	Earphone,Stereo	EAB62209202	EMB-LGE016STKC 20mW 16OHM 115DB 20HZTO20KHZ 1.1M BLACK 3.5 L TYPE STEREO 4POLE PLUG OPEN TYPE CRESYN CO.,LTD	